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Improving Patient Access by Determining Appropriate Staff Mix in the Family Practice Clinic of Bayne-Jones Army Community Hospital at Fort Polk, Louisiana Using an Animated Computer Simulation Model

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This study was the direct result of customer dissatisfaction due to problems associated with access into Bayne-Jones Army community Hospital (BJACH). On a recent Military Health Service System Performance Report Card, BJACH received satisfaction rates of only thirty-two percent and thirty-seven percent for "satisfaction with access" and "percent meeting appointment waiting standards," respectively. Therefore, the terminal objective of this study was to ascertain the most suitable staff mix in the BJACH Family Practice Clinic in order to enhance patience satisfaction by increasing their access to care. This determination was made by developing, running, and analyzing a number of separate animated simulation models using MedModel Simulation Software. The first model used the current, or status quo, staff levels. It was run with eight providers with two exam rooms each and a nursing staff of nine. The second model, the TDA model, was based on BJACH's current TDA authorized staff. This model was comprised of sic providers with two rooms each and eight nursing staff members. The final models used alternate staff numbers and examination room assignments. The best of the alternate models was Alternate Model D. This model consisted of seven providers assigned two or three rooms each and ten nursing staff. After the simulations were completed, the derived data was placed in a decision matrix and analyzed. Upon completion of the analysis, it was determined that the greatest patient access to the BJACH family practice providers was experienced with the staff levels and configuration defined in Alternate Model D. For this reason, it was recommended for implementation.

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Abstract

This study was the direct result of customer dissatisfaction due to problems associated with access into Bayne-Jones Army Community Hospital (BJACH). On a recent Military Health Service System Performance Report Card, BJACH received satisfaction rates of only thirty-two percent and thirty-seven percent for "satisfaction with access" and "percent meeting appointment waiting standards," respectively. Therefore, the terminal objective of this study was to ascertain the most suitable staff mix in the BJACH Family Practice Clinic in order to enhance patient satisfaction by increasing their access to care. This determination was made by developing, running, and analyzing a number of separate animated simulation models using MedModel® Simulation Software. The first model used the current, or status quo, staff levels. It was run with eight providers with two exam rooms each and a nursing staff of nine. The second model, the TDA model, was based on BJACH's current TDA authorized staff. This model was comprised of six providers with two rooms each and eight nursing staff members. The final models used alternate staff numbers and examination room assignments. The best of the alternate models was Alternate Model D. This model consisted of seven providers assigned two or three rooms each and ten nursing staff. After the simulations were completed, the derived data was placed in a decision matrix and analyzed. Upon completion of the analysis, it was determined that the greatest patient access to the BJACH family practice providers was experienced with the staff levels and configuration defined in Alternate Model D. For this reason, it was recommended for implementation.

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Introduction

More than twenty years ago, Fuchs described three major dilemmas facing the American healthcare system: "high and rapidly rising costs, inequalities and difficulties in access, and large disparities in health levels" (1974). These issues, along with a renewed concern for quality of care and a great dissatisfaction among tax payers about the escalating federal debt, have brought healthcare matters to the forefront of national politics (Cooper 1995). This is not surprising when one considers healthcare accounts for more than eleven percent of the entire U.S. gross national product (James 1996). Consequently, "major employers are demanding lower cost health benefit options, cost-containment efforts, and measurable indicators of quality and value" (Masters 1993). Again, this is not alarming when one considers the following example: "Chrysler Motor Corporation estimates that workers' healthcare benefits add more than $600 to the price of every American-made car. By contrast, Japanese cars are manufactured with less than $300 in healthcare overhead" (James 1996). In 1997, the Department of Defense (DoD) healthcare system operates 115 hospitals and 471 clinics. These are staffed by approximately 147 thousand military and civilian personnel. Their annual budget is about $10 billion (U.S. Congress 1997), which accounts for six percent of the DoD budget (GAO 1997). Due to these substantial figures, the DoD healthcare system has been charged with a task similar to that of civilian industry. As a result, the DoD

healthcare system is implementing managed care as a remedy for the current healthcare crisis.

Through health promotion, capitated budgets, and tight control and review of utilization, managed care decreases spending on healthcare (Kongstvedt 1995). Some experts dispute this reputed savings, however, because they believe the limited data and short duration of studies have skewed the results (Pelligrino 1994, Cooper 1995). Nevertheless, managed care appears to meet national and military healthcare goals. There are, however, other problems associated with managed care which require resolution.

A number of experts continue to ask whether managed care organizations can maintain the standard of care and increase access while cutting costs (Pelligrino 1994, Cooper 1995). Many are also concerned about the effect managed care has had on the sacred patient-physician relationship (Cooper 1995, Fielding 1995). Can patients still trust their physicians to act in a purely ethical manner and treat them to the best of their abilities without regard to cost? Are physicians still the healthcare advocate for patients, or do they now merely answer to their financial masters, managed care organizations? What about autonomy, beneficence, nonmaleficence, and justice? Is the Hippocratic Oath a relic of the past? These questions bring up some interesting issues which have yet to be fully addressed. As military hospitals move further into the managed care environment, leaders must be keenly aware of these important issues.

Bayne-Jones Army Community Hospital (BJACH), a member of the Great Plains Regional Medical Command (GPRMC) and TRICARE Region VI (TRICARE Southwest), is a small, fifty-eight bed (Butler 1996) military medical treatment facility nestled in the pine forests of Central Louisiana. The hospital's mission statements is: "We provide the best to the United States soldier, the Fort Polk community and Joint Readiness Training Center (JRTC) by delivering quality, accessible, patient oriented health care, while maintaining our preparedness to support the Army mission" (MEDDAC Regulation 10-1 1995). This mission is accomplished through the dedicated service of approximately 190 military and 450 civilian employees (BJACH Personnel Division 1996). In fiscal year 1996 (FY96), the hospital provided healthcare services to an estimated 31,950 beneficiaries with a budget of $32.5 million. Beneficiaries seen at BJACH are mainly active duty service members and their families who are associated with the major units at Fort Polk. These units include the 2d Armored Cavalry Regiment, the Operations Group, the Warrior Brigade, and the United States Army Medical Department Activity (USAMEDDAC) - Fort Polk. Another large group of beneficiaries includes retirees and their family members. In total, these customers made roughly 291,850 clinic visits and occupied 9,214 bed days, with an average length of stay of 2.2 days (BJACH Resource Management Division 1997).

Primary care for beneficiaries at Fort Polk is administered through BJACH's primary care clinics which include family practice (FP), internal medicine, and pediatrics. Specialty care available at BJACH includes obstetrics / gynecology, orthopedics, physical

therapy, occupational therapy, otolaryngology, podiatry, ophthalmology and optometry, dermatology, preventive medicine, psychiatry and psychology, social work services, dietary care, and general surgery. Ancillary support is provided by the radiology department, the laboratory, and the pharmacy. These services are fully supported by the clinical support division, the resource management division, the logistics division, the patient administration division, the personnel division, and the plans, training, mobilization and security division. Since this study focuses on the FP clinic, it will be reviewed in detail.

The family practice clinic at Bayne-Jones Army Community hospital has as its mission:

> To provide accessible, quality and customer oriented health care to all assigned beneficiaries. To educate our beneficiaries in health care and policies of Family Practice. To provide opportunities for continuing education of all staff members. To support the mission of our facility by complying with all guidelines set forth (MEDDAC Regulation 10-1 1995).

The vision for the family practice clinic is as follows:

> It is the philosophy of the Family Practice staff that the health care needs of all beneficiaries will be met in an effective and efficient manner. We, as a staff, will employ all means possible to have a positive impact on each beneficiary visit (MEDDAC Regulation 10-1 1995).

The FP clinic is located on the second floor of the main hospital building. It has an estimated twenty-three thousand square feet of floor space which accommodates seven

screening rooms, thirty-four examination rooms, twenty provider offices, six nursing stations, a classroom, a break area, a procedure room, a number of administrative offices and storage areas, and waiting areas large enough to seat a total of 126 patients. See Annex A for an annotated diagram.

The clinic staff authorized by the table of distribution and allowance (TDA) (i.e., the personnel and equipment authorization document used for fixed medical treatment facilities) is ten physicians, two physician assistants, eight nurses, nine nursing assistants, seventeen medical clerks, one secretary, three non-commissioned officers (NCOs), and one administrative assistant (USAMEDDAC 1996). The current staff comprises fourteen physicians, one nurse practitioner, two physician assistants, eight nurses, eleven nursing assistants, twelve medical clerks, one secretary, one non-commissioned officer in charge (NCOIC), and one administrative assistant (Abbott 1996). The staff normally works an eight hour shift on each week day. This time period allows each physician to have a basic appointment template (i.e., patient appointment schedule) which allows for twenty-one appointments per day. The appointments are fifteen, thirty, and forty minutes in duration according to type (e.g., initial appointment, well-woman appointment, well-baby appointment, physical examination, or follow-up appointment). There is also a night clinic which is staffed by at least one physician and one nurse from five o'clock in the afternoon until seven o'clock in the evening. Individual FP physicians also perform on-call duties approximately three times per month. In addition, the clinic supports the

emergency room roughly ten days per month. Furthermore, the FP clinic provides one physician on a daily basis to support the troop medical clinic (TMC) (Abbott 1997).

The FP physicians are paired to form teams which have TRICARE prime patients impaneled to them. These panels range in capacity (i.e., the maximum number of TRICARE Prime patients a team is capable of providing care for) from a low of 1,150 patients per team to a high of 1,852. The difference in panel size is due to factors including leadership duties, additional duties, and provider experience. These figures are extremely low when one considers the Office of the Surgeon General (OTSG) recommends one primary care provider (PCP) per 1,000 to 1,250 enrolled beneficiaries (Ledlow 1996). Currently, there are seven panels with a capacity of 11, 987 beneficiaries, and total enrollment of approximately 9,048 (BJACH Clinical Support Division 1996). The FP panels are illustrated at figure 1.

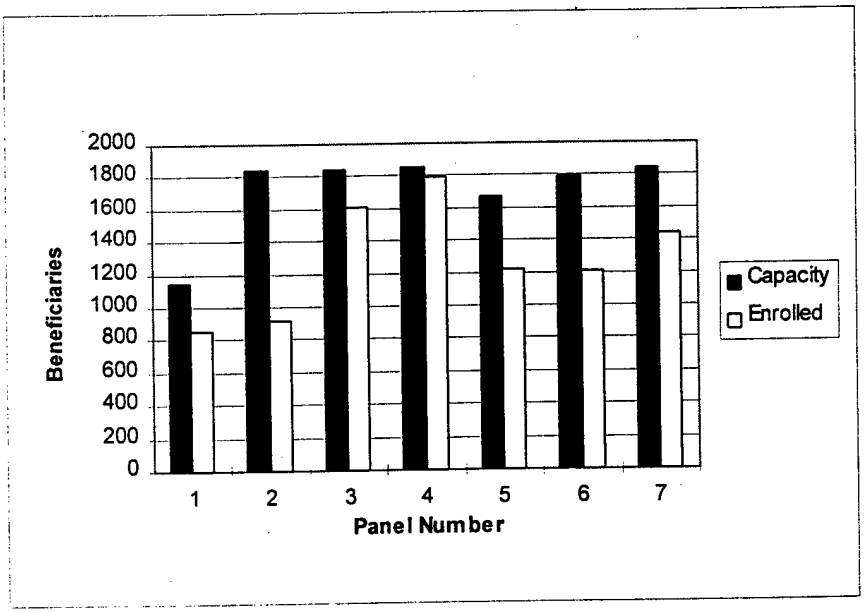

Figure 1. Family Practice Patient Panels

Non-TRICARE Prime patients are not enrolled in panels, but are allowed access when space is available. According to a DoD Health Affairs policy memorandum to the services, priority for patient access is, in order: active duty service members; enrolled active duty family members; enrolled retirees, survivors, and their authorized family members; active duty family members not enrolled; and, last, all others who are not enrolled in TRICARE Prime (Joseph 1997).

Conditions Which Prompted the Study

Bayne-Jones Army Community Hospital, like most managed care organizations, continues struggling with the "iron triangle" of the healthcare industry: quality, access, and cost.

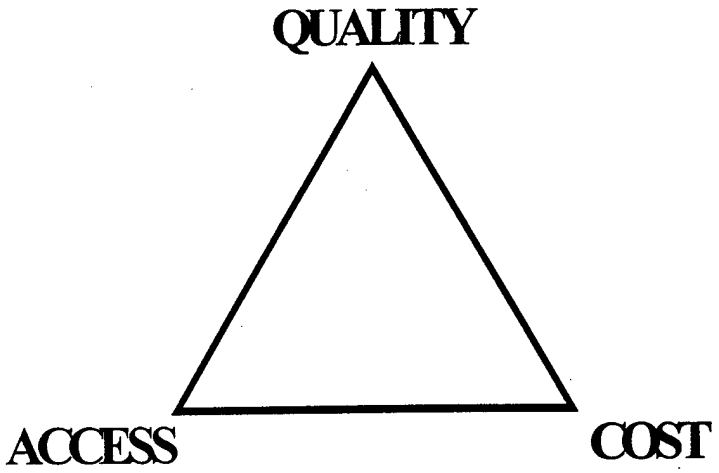

Figure 2. The Iron Triangle of Healthcare

"[The iron triangle] label derives from difficulties in achieving simultaneous improvements in quality, efficiency, and access, thereby forcing tradeoffs between different sides of the triangle" (Burns 1995). As a matter of fact, this study is the direct result of customer dissatisfaction due to problems associated with access into Bayne-Jones Army Community Hospital and long waiting periods once inside. On a recent Military Health Service System Performance Report Card, BJACH received satisfaction rates of only thirty-two percent and thirty-seven percent for "satisfaction with access" and "percent meeting appointment waiting standards," respectively. The goals in these areas are ninety-five percent and ninety-eight percent (Department of Defense - Health Affairs 1997). Moreover, this problem can be confirmed locally on a more personal basis because on a daily basis, whether at the hospital or at home, employees of the hospital, including the author, are deluged with questions about why patients are having difficulty getting appointments and why the waits are so long. Customer dissatisfaction in these areas is quite apparent. This study seeks to find the answers to these frustrating questions.

A secondary reason for the study is the cost of healthcare continues to rise and military medical treatment facility budgets continue to plummet. Hopefully, as a result of this study, cost savings may be realized through increased efficiency due to appropriate staff mix. This cost savings may then be added to resources available to pay for the direct care of patients.

Lastly, upon completion of this simulation project, the model may be manipulated in out years to compensate for changes over time. In this way, the leadership may continue to examine methods for optimizing staff levels within the clinic. Likewise, this model may serve as a basis for modeling other clinics within Bayne-Jones Army Community Hospital. In this way, the entire hospital may benefit in the future from what is now a site specific project.

Statement of the Problem

Bayne-Jones Army Community Hospital is experiencing a high level of customer dissatisfaction due to problems associated with access into the family practice clinic and long waiting periods once inside. Furthermore, the Assistant Secretary of Defense for Health Affairs, his principle deputy, and the three Surgeons General have emphasized the DoD overall satisfaction rate of about sixty percent is not good enough and must be brought to ninety-five percent or better (Tomich 1997). Moreover, on a too frequent basis, employees of the hospital are inundated with protests and negative remarks about obstacles in getting appointments and long waits once in the clinic. Customer dissatisfaction in these areas is in great need of attention and must be addressed before patients decide to use their option of acquiring a primary care manager (PCM) outside BJACH. The Air Force Surgeon General, Lieutenant General Charles Roadman may have said it best when he stated, "We need a system so good that no one would dream of leaving it" (Tomich 1997).

The terminal objective of this study is to ascertain a staff mix in the BJACH FP clinic which enhances patient satisfaction by increasing their access to healthcare providers. This determination will be made by developing and analyzing at least three separate simulation models. The first will use the current staff levels and will be called the status quo model. The second model will be the TDA model, and it will be based on BJACH's current TDA authorized staff. The final model, or models if necessary, will use

alternate staff numbers and examination room assignments. These models will model one half of the family practice clinic since it consists of two sides, Clinic A and Clinic B, which are nearly identical. For a complete annotated diagram of the clinic, see Annex A. Next, the models will be run for a fitting duration, and then the statistical results of each model will be compared. Finally, the staff mix which demonstrates the best access and other desirable attributes will be recommended.

Literature Review

This study uses animated simulation modeling to help answer questions concerning the BJACH FP clinic, therefore it is prudent to examine literature on the subject. "No one is certain when the first model was developed, but the principle of using symbolic representations to better understand the interactions of various parts of a system is probably as old as the scientific method" (Harrell 1996).

Commonly cited early modeling techniques included the queuing theory. "Queuing theory dates back to the work of A. K. Erlang in 1908; in Erlang's and subsequent work up to approximately 1945, its applications were restricted mainly to telephone systems" (Gupta, Zorenda, and Kramer 1971). Since that time, however, the theory has been applied to a variety of other areas, including the healthcare industry. "Welch and Bailey pioneered its use in the health field in evaluating appointment systems for an outpatient department, and the study of scheduling systems remained its main application in the health field until Hausmann took a different perspective in using it to

establish an index of quality of care based on waiting times for service" (Gupta, Zorenda, and Kramer 1971). These studies were breakthroughs in their time and warrant consideration even today.

Other modeling techniques have been used in the healthcare industry as well. One such model was developed in the early 1960s by Balintfy. In his model, Balintfy "attempted to develop a random model for the arrival process of hospital inpatients. He based the model on an examination of the effects of disease proneness, contagion, and time on the risk function of the population (Swartzman 1970). Then, a decade later, Rising and associates performed an analysis of waiting times using a Monte Carlo simulation model. Subsequently, the authors developed a successful appointment schedule where more patients were appointed and seen during low walk-in periods. In this way, the providers had less idle time and more patients were seen (Rising, Baron, and Averill 1971). Furthermore, in 1977, Clayden developed a model which "predicts the incidence of morbidity and mortality in a specified population and the changes in resource use over a period of years. Thus it is possible to see the long term effects of changes in population size and structure alongside the effects of management decisions on the use of health resources" (Clayden 1977). Additionally, in 1987 Wright created an advanced model in order to determine "simulated patient arrivals to assess utilization in specific inpatient and outpatient departments within a hospital," which was a follow-up to Fetter and Thompson's 1965 study (Butler and others 1992). These studies, too, hold valuable lessons for today's healthcare manager.

A more recent model was developed in 1992 by a team of researchers headed by Butler. Butler's model was developed to analyze "the complex interations comprising patient placement processes, beginning with patient arrival and continuing through discharge. The model reflects current and potential patient assignment policies . . ." (Reeves 1992). This analysis was performed using Simscript® II.5 software which allows a wide variety of statistical analysis, but does not have an animation feature. For this reason, although Butler's model performed an outstanding service, clients who required a more visual solution may not have been as receptive to his conclusions and recommendations had animated simulation been utilized.

The greatest advances in modeling have occurred in the last couple of years with the tremendous growth and proliferation of extremely powerful, yet compact computers. These computers have allowed users to take the next step in modeling systems through more sophisticated simulation. Simulation is defined by Harrell as "a means of experimenting with a detailed model of a real system to determine how the system will respond to changes in structure, environment or underlying assumptions." Furthermore, the author states, "A well-constructed model will generate estimates of system performance in terms of throughput, resource utilization, queue requirements and productions times" (1996). Moreover, simulation can help account for variance.

> In "real world" systems, many things do not happen in exactly the same way each time they occur. Even in the most highly automated processes, the impact of machine down times, transporter failures and other less-than-ideal situations combine to create an environment of uncertainty. Once human factors are included, of course, the potential for variation increases dramatically. Simulation is unique among decision tools in its ability to cope with these variations and provide estimates of their influence on the performance of a system (Harrell 1996).

Fortunately, simulation has been found to be a "useful and powerful tool" in evaluating designs in the healthcare industry (Law and Kelton 1991). As a matter of fact, Arnold Mahachek of The Johns Hopkins Hospital states, "simulation of patient flow is a remarkably useful tool. With today's software for personal computers, simulation is no longer just for academics and consultants. Senior and mid-level managers should actively seek out simulation as a problem-solving technique" (1992). Mahacheck also believes:

> Two primary reasons for using simulation are credibility and chaos. Every level of health-care management is competing fiercely for limited resources. The inherent credibility of any resource request is becoming a major decision parameter. Simulations boosts credibility by its structurally mandated analysis of event chronology, volume, mix, and staff size. These and other management variables in patient flow environments exceed the capacity of one person to control. Simulation is a practical tool for analyzing such a chaotic and dynamic terrain. The use of transient conditions is crucial since simulation frequently shows that policies which are statistically rational prove to be dynamically irrational (1992).

Keller and Harrell concur with Mahacheck's assessment. In a recent article, they state one of the most difficult problems facing healthcare administrators and other analysts is "the evaluation and analysis of just exactly what occurs in the healthcare

process." Keller and Harrell explain simulation modeling further by stating, "This means, where delays and bottlenecks occur, what's efficient and what's not and what the overall effect may be of adopting different patient management models"(1996). In effect, a simulation model is a detailed scale model of a system which closely imitates events and actions which occur within a system. The simulation performs these episodes in a very compressed time, which allows a model to emulate the long-term behavior of a system in a short time (Levy, Watford, and Owen 1989). Moreover, Keller and Harrell say another primary reason for using simulation is ". . . because there are just too many interrelated and highly varied steps involved in any given healthcare process scenario to watch them all" (1996).

No known previous attempts have been made to model any clinics, functions, or processes at Bayne-Jones Army Community Hospital; however, there have been a number of studies performed to determine appropriate physician specialty mix (Cote 1992), most efficient organization (MEO) (Tuell III 1994), and physician productivity (Tanner 1995).

In Cote's study, the purpose of the investigation was "to determine a physician staff mix which will meet the needs of the Bayne-Jones Community Hospital catchment area population following the down sizing of Fort Polk" (Cote 1992). This analysis was performed when it was announced the post would experience a one third reduction in forces over a two year period due to base realignment and closure (BRAC) initiatives

mandated by congress. Having seen previous BRAC endeavors, the command determined the requirement to reduce the post's force structure would lead to a decline in hospital beneficiaries; therefore, it was essential to plan for the eventual decline in hospital staff as well. In planning for this cutback, it was also imperative to decide which medical specialties would absorb the reductions. The appropriate staff mix was eventually determined using a two-phased approach. Phase one settled upon a general specialty staff mix using the results of the *Medical Corps Optimization Study* (James and Williams 1990). Phase two then tailored the physician mix specifically for the Fort Polk beneficiary population. Finally, Cote recommended the adjusted staff mix derived from his study as a solution to the problem. This recommendation included a necessity for eighteen family practice physicians (Cote 1992).

In 1994, the Army Health Services Command (HSC) performed an on-site manpower staffing assessment at BJACH. The study's purpose was to determine "most efficient organization (MEO) estimates reflecting the optimum staffing needed to perform the most recent fiscal year workload available." In this case, the most recent figures available were from the military expense and performance reporting system (MEPRS) codes for fiscal year 1992. Although the study was conducted during the draw down, the data used in the study was collected prior to the down sizing of Fort Polk. Consequently, the study recognized "[t]he departure of military units from Fort Polk caused a dramatic decrease in reported workload for several areas." Therefore, an adjustment for the projected decreased beneficiary population was integrated. Finally, a recommendation

for a distribution of employees by category (e.g., provider, direct care professional, nurses, direct-care paraprofessionals, and clinical / administrative support personnel) was made. In conjunction with these suggestions, the proposal established "benchmark manpower requirements to assist [the hospital] in accomplishing [its] business plan and in managing . . . alternative sources of labor." Furthermore, the study stressed, "The indicated manpower estimates represent the minimum essential number of manpower requirements necessary for each specialty or work center for the specified workload . . . not staff ceilings." In conclusion, the MEO suggested the following breakout of personnel by work category for the FP clinic: 10.5 providers, 1.0 direct-care professionals (i.e., physician assistants and nurse practitioners), 2.6 registered nurses, 16.7 direct-care paraprofessionals (i.e., licensed practical nurses and nursing assistants), and 10.1 clinical / administrative support personnel (Tuell III 1994).

Tanner's study sought to "determine productivity measures for family practice physicians within the context of delivering care . . . at Bayne-Jones Army Community Hospital . . ." He proposed to develop these measures using three approaches. The first approach consisted of a physician time study. In the time study, the author found "individual family practice physicians may devote between 97 to 104 hours per month to appointed patient care." Tanner further states, "The time study revealed significant differences between the amount of patient care hours military physicians may provide compared to their civilian counterparts. This may be due to the specific duties required by military service." On the other hand, the author also found family practice physicians

at BJACH fall well below the established U.S. Army Medical Command's (MEDCOM) benchmarks for weekly, monthly and yearly time (measured in hours) spent in the clinic seeing patients. These figures are presented at Table 1.

Time Period	MEDCOM Benchmarks	BJACH Historical
Weekly	32.2	22.5
Monthly	128.8	97.4
Annual	1546.2	1168.8

Table 1. MEDCOM Clinic Time Benchmark Comparison

The second measure Tanner utilized was an analysis of auxiliary personnel working in the family practice clinic. In this portion of his study he found "the use of auxiliary personnel can have a substantial and positive impact on the average physician's productivity." He notes, however, "Reinhardt found that the marginal product of auxiliary input to physician productivity levels reaches zero at a level of between 5.0 and 5.5 aides per physician."

The final measure Tanner employed was a comparison of productivity between organizations. In this measure, the author discovered that while BJACH FP physicians cared for 2.9 patients per hour, which is below the MEDCOM benchmark of 3.3, they actually saw more patients than the vast majority of like civilian organizations which were studied. However, he also found, at that particular time, the ratio of auxiliary

support personnel (not including administrative support) to physicians was 1.9 to 1. This ratio was slightly above the MEDCOM benchmark of 1.86 to 1. Including all auxiliary staff, the ratio was found to be 3.9 to 1. Tanner concluded this ratio indicated the clinic was "overstaffed" (Tanner 1995).

A recent simulation project conducted in a DoD medical facility was performed by Ledlow at the Army hospital located in Heidelberg, Germany. The purpose of Ledlow's research effort was to "determine optimal provider staffing and process configuration." This task was accomplished using MedModel® healthcare simulation software. For the project, the author created three separate models: a status quo model, a physician-only model, and a combination (physicians and extenders) model. The status quo model was based on the following: there are six family practice providers available (five military and one civilian) with an average availability rate of seventy percent, each provider utilizes one examination room, providers care for between twenty-three and twenty-five patients a day, and the beneficiaries' mean clinic use rate is 4.7 visits per enrollee per year accounting for 48,372 annual clinic visits. The two alternative models were based on the status quo model with specific changes made to support the study's objectives. The status quo model was quickly disqualified because it could not accommodate the necessary beneficiary population. The other two models sufficiently supported the adjusted beneficiary utilization figures (48,372 for the physician model and 51,033 for the combination model due to a twelve percent margin for internal referrals from extenders), but required change because waiting times were excessive. The

modifications incorporated into Ledlow's revised simulation included two examination rooms per provider and screening performed in the examination room rather than in a separate screening room. With these revisions, the simulation demonstrated both models could adequately sustain the hospital's mission with the criterion illustrated in table 2.

Resource / Process	Physician Model	Combination Model
Quantity of Physicians	8	5
Quantity of Extenders	0	4
Annual Cost (Providers)	$777,688	$742,059
Annual Cost (per Enrollee)	$75.55	$72.09

Table 2. Initial Comparison of Ledlow's Models

However, after the changes to the simulation, Ledlow found significant differences between the models in other areas. These areas included: annual capacity, total patient wait time, total time patients spent in the clinic, and provider utilization rates. These differences are shown in table 3.

Process / Capacity	Physician Model	Combination Model
Annual OPV Capacity	48,383 (48,372 required)	50,347 (51,033 required)
Total Patient Wait	19.28 minutes	7.88 minutes
Provider Service Time	16.88 minutes	16.89 minutes
Total Patient Time	40.82 minutes	29.66 minutes
Provider Utilization	72.01%	66.41%

Table 3. Second Comparison of Ledlow's Models

The author concluded his study with a decision matrix which compared the alternative models. After discussing the viability of the models with hospital leadership and analyzing the information summarized in the decision matrix, Ledlow made a determination that the physician model best met the needs of the facility and its beneficiary population (Ledlow 1996).

A similar study was performed by Levy, Watford, and Owen in 1989. The intent of this investigation was to develop a model which demonstrated how two separate outpatient clinics from different locations could be consolidated in order to decrease patient confusion, streamline patient flow, and strengthen economies of scale. The authors performed their simulation using SIMAN® simulation language after an initial analysis of outpatient volumes and arrival patterns at both the clinics. Subsequently, they created a "comprehensive model of the outpatient process through registration, holding, and specific outpatient services" (Levy, Watford, and Owen 1989).

Although these studies were successful, none is based on the most current data or the present configuration of Bayne-Jones Army Community Hospital. Nevertheless, each provides valuable insight into possible methodologies for addressing Bayne-Jones Army Community Hospital's current access problem. Moreover, some of the studies provide data which may be used as benchmarks or comparison tools. Table 4 shows recommended staffing levels from a number of these different studies.

	Current	TDA	Cote	MEO
Providers	17	12	18	12
Nursing	19	17	--	19
Clerks	12	17	--	10

Table 4. Comparison of Staffing Recommendations from Literature

Purpose

The purpose of this study is to find a staff mix for the FP clinic which provides the greatest patient access to healthcare providers. To aid in making this judgment, the following hypotheses will be examined using the statistical data derived from examining the three simulation models.

Hypotheses

MODEL 1: Status Quo Model.

H_o: The status quo model (current staff mix) allows for the greatest access to family practice providers by patients.

H_a: The status quo model does not allow for the greatest access.

MODEL 2: TDA Model.

H_o: The TDA model allows for the greatest access to family practice providers by patients.

H_a: The TDA model does not allow for the greatest access.

MODEL 3: Alternate Model.

H_o: An alternative model allows for the greatest access to family practice providers by patients.

H_a: An alternative model does not allow for the greatest access.

Variables

The following variables will be utilized to test the hypotheses:

Dependent variable: number of patients provided direct care (i.e., access) (y).

Independent variables: number of physicians, physician assistants, and nurse practitioners providing direct care (x_1),
number of registered nurses, licensed practical nurses, and nursing assistants assisting providers (x_2), and
number of medical clerks (x_3).

The functional relationships of the variables may be defined as follows:

$$y = f(x_1 + x_2 + x_3)$$

Objectives

The objectives of this study are defined as follows:

1. Terminal Objective: Determine what staff mix allows for the greatest patient access to healthcare providers.

2. Enabling Objectives:

   a. Research the literature for similar and / or pertinent books and articles.

   b. Collect family practice outpatient visit data.

   c. Collect inter-arrival and service time data.

   d. Perform a functional analysis of the family practice clinic.

e. Develop a conceptual model of the clinic.

f. Design, build, run, and debug an initial simulation model of the clinic.

g. Prepare and run the primary simulation models.

h. Analyze the data derived from the simulation models.

i. Create a decision matrix to compare the statistical results.

Methods and Procedures

Prior to developing the simulation model, it was necessary to collect pertinent data. This data included family practice clinic outpatient visits, inter-arrival times, and a variety of service time data. Data was collected by the means described below.

The actual number of daily family practice visits (i.e., the number of patients who received direct care from a provider) was derived by performing an analysis of outpatient visit (OPV) data provided by the FP clinic administrator. It was prudent to use this manually tabulated data to enhance validity and reliability of the study because available figures from the composite healthcare system (CHCS) and the military expense planning and reporting system (MEPRS), which have input from a variety of sources, both include counts for patients not actually seen by a provider (e.g., prescription refills and telephone consults). In addition, the ambulatory data system (ADS) is not fully implemented and all patient visit are not yet accounted for. Needless to say, data from each of these sources is quite divergent. The hand tabulated data, on the other hand, was collected by FP clerks, under the strict supervision of the FP clinic administrator and the lead medical clerk, over a seven month period as patients were logged in for appointments. This data, which only includes patients who received direct care from a provider, was then personally compiled by the family practice clinic administrator (Abbott 1996). For this study, the raw data was placed in a spreadsheet and a mean, median, minimum, maximum, mode, and standard deviation were calculated. Table 5 displays the raw FP

OPV data to include: total patient count per month, total whole days worked by physicians per month, and mean number of patients seen per provider per day for the month. Figures for September were not available. For the complete data set see Annex A.

	Total Patient Encounters per Month (A)	Total Days Worked by Providers (B)	Mean # of Patient Encounters per Provider per Day (A/B)
May 1996	3262	138.50	23.55
June 1996	2935	146.25	20.07
July 1996	3491	191.00	18.28
August 1996	3482	190.50	18.28
October 1996	3797	221.50	17.14
November 1996	2640	150.00	17.60

Table 5. Raw Family Practice Outpatient Visit Data

It is interesting to note that, in most cases, as the number of days worked by providers increased, the mean number of patients seen per provider each day declined. This finding clearly warrants further consideration, but is outside the scope of this study.

Table 6 depicts descriptive statistics derived from the analysis of the raw data from the table above. It includes the mean, median, minimum, maximum, mode, and standard deviation for patient count and days worked by providers. It also shows the mean and standard deviation for number of patients seen per provider per day.

	Patient Count	Days Worked by Providers	Patients/Provider/ Day
Mean	3267.83	172.96	18.89
Std Deviation	419.68	32.92	--
Median	3372.00	170.25	--
Minimum	2640.00	138.50	--
Maximum	3797.00	221.50	--
Mode	none	none	--

Table 6. Descriptive Statistics for Raw Family Practice Outpatient Visit Data

The inter-arrival times and service time data were derived using on-site collection methods over a period of days, and at different times of the day. As patients (n = 120) entered the clinic they were asked to record specific times in their appointment processes on a researcher-provided data collection document. These times included: time of arrival at reception, length of time at reception, appointment time, time called to screening room, length of time in screening room, time called to the examining room, time seen by a provider, and time released by the provider. A copy of the data collection form is at Annex A. Prior to collecting this data, however, the patient flow within the family practice clinic was analyzed.

Typically, patients present to the reception desk prior to their appointed times. The queue length at reception varies depending on the availability of one of the two clerks to service each patient. Once at the head of the line, the patient sees the next

available clerk. After completing the reception process, the patient is directed to have a seat in the waiting area. During this first waiting period, patients linger until they are called for screening. The screening process takes place in a screening room allocated one per hallway, and customarily includes weighing, blood pressure and temperature checks, and allergy screening. Upon completion of screening, patients are asked to return to the waiting room until they are called to go to an examination room. Once called to an examination room, the patient is required to wait until their provider arrives. Once the provider arrives, the patient is examined. Finally, once patients are released by the provider, they are free to depart the family practice clinic area. Figure 4 illustrates patient flow within the clinic.

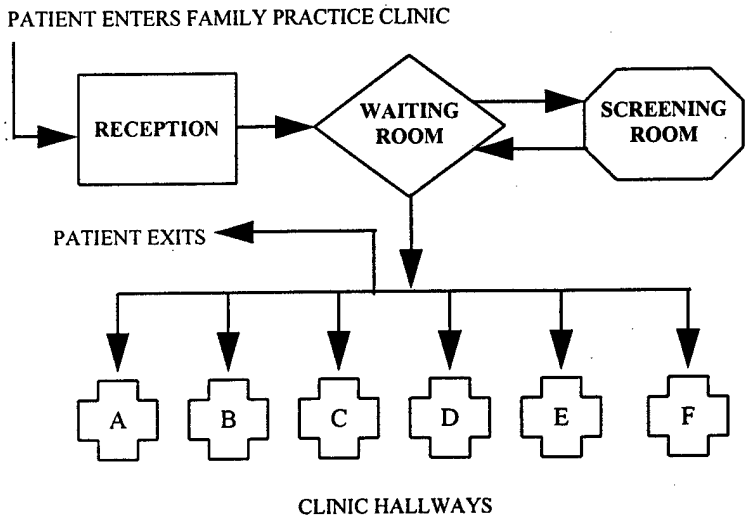

Figure 4. FP Clinic Patient Flow Diagram

After gathering inter-arrival and service data, and placing it in a spreadsheet, the amount of time spent performing specific tasks was derived by subtracting one time from another.

Next, a mean, median, minimum, maximum, mode, and standard deviation of the resulting times were calculated. For complete inter-arrival and service time data see Annex A. Table 7 displays descriptive statistics derived from analyzing the patient inter-arrival and service time data.

	Early Arrival	Wait for Screen	Wait for Exam Room	Wait in Exam Room	Time with Provider	Total Time in Clinic
Mean	00:19:25	00:09:49	00:06:42	00:11:39	00:14:52	00:50:00
Std Dev	00:15:18	00:09:30	00:15:33	00:13:19	00:11:00	00:25:00
Median	00:16:00	00:08:01	00:00:47	00:07:00	00:10:00	--
Minimum	--	00:00:04	00:00:01	00:00:00	00:00:00	--
Maximum	--	01:08:06	01:40:28	01:21:00	01:03:00	--
Mode	00:10:00	00:08:04	00:00:39	00:00:00	00:10:00	--

Note: All times are in hh:mm:ss format.
* 2.5% of patients observed were late.

Table 7. Family Practice Patient Inter-arrival and Service Time Data

After completing this essential data collection and analysis, a conceptual model was designed. Upon satisfactory conclusion of this step, a rudimentary family practice clinic model was designed using MedModel® healthcare simulation software from ProModel Corporation. ProModel describes this software as:

> . . . a powerful, Windows based simulation tool for simulating and analyzing healthcare systems of all types and sizes. MedModel provides the perfect combination of ease-of-use and complete flexibility and power for modeling nearly any situation, and its realistic animation capabilities make the simulation come to life (1996).

Furthermore, the software manufacturer states:

> MedModel provides engineers and managers the opportunity to test new ideas for system design or improvement before committing the time and resources necessary to build or alter the actual system. MedModel focuses on issues such as resource utilization, system capacity, and capability. By modeling the important elements of a health care system, you can experiment with different operating strategies and designs to achieve the best results (1996).

The procedures involved in setting up the simulation were numerous. The first task was converting a computer aided drawing (CAD) of the entire family practice clinic into an appropriate background for the model. Next, the clinic pathways (i.e., routes used by entities and resources throughout the clinic drawing) and other needed locations were created. Following this effort, entities (i.e., patients) were defined. Afterwards, the resources (i.e., the providers, nurses, nursing assistants, and clerks) were positioned, and assigned shifts, breaks, and locations to search for work. Subsequently, operation logic and routing for entities was developed. Finally, start and stop parameters were set. Once this basic model was constructed, it was run with a limited patient flow, and subsequently debugged. Afterwards, the first complete model (status quo model) was built using current staff numbers and current patient arrival figures. Once the model was verified, validated, and credible, it was run for a period of five days with twelve replications. This run period accounts for twelve weeks, or one quarter of a year. Next, the statistical results were analyzed. The second model, the TDA model, was then constructed and run using the same steps as the initial model. Identical statistics were tallied and analyzed for the second model. Last, an alternate model was developed and run, and the statistics

were examined. The results of these simulations may be viewed at Annex B. It was then determined that further study was needed because the 79 patient arrivals did not fully test the system. Consequently, patient numbers were increased to fully tax the system. In addition, several different alternate models were created. These models were manipulated until a mix was found which allowed for greatest number of patients while maintaining a satisfactory patient waiting time. The statistics from the models were then compared. The text printout of these models may be examined at Annex C. Statistical results are located at Annex D.

Limitations

These simulations were limited in scope due to the dynamic and chaotic environment Bayne-Jones Army Community Hospital is currently experiencing (e.g., severe budget cuts, ambitious re-engineering efforts, preparation for a Joint Commission on Accreditation of Healthcare Organizations (JCAHO) survey, and massive personnel turnover). Secondly, the hospital, like all other DoD healthcare facilities, is experiencing an inability to make sweeping changes due to congressional directives mandating current civilian end strength. These hindrances make it nearly impossible to model the clinic's functions precisely; however, they have not precluded proactive efforts to become a more patient-focused, quality driven organization which strives to increase access and "delight" our customers. In addition, since time available to model the clinic is constrained, the level of detail in the simulation is limited. Specifically, systems and processes both

inside (e.g., phone clerks, records retrieval) and outside the FP clinic (e.g., pharmacy, laboratory, radiology) are not included in the model. The simulations also do not take into account daytime emergencies or other contingencies that may detract from normal operation of the clinic. Given an unrestricted amount of time, the intricacy incorporated into the model could be much greater. Furthermore, in the simulation, patients are considered only in terms of service times regardless of the acuity of their illness. Similarly, patients are seen on a first come - first served basis regardless of appointment time or enrollment status. All of these factors clearly play an important role in everyday operation of the FP clinic.

Assumptions

The following assumptions are necessary in order to properly perform this particular study of the BJACH family practice clinic:

1. The current configuration of the clinic in regard to space utilization and room arrangement is satisfactory as is, and should not be changed to enhance efficiency.

2. Due to the lack of moral hazard, the number of patients seeking access to healthcare in the family practice clinic is now and will remain consistently greater than capacity of patient appointments (i.e., supply will never meet demand).

3. The time available to provide care is relatively constant due to resource restraints (i.e., neither enough funds nor personnel are available to increase the amount of available appointments).

4. Collected data is representative of year-round clinic practice.

5. Appointed and walk-in patients interact within the system in a similar manner.

6. The current supply system and ancillary service support are adequate (Historically, supply limitations have not adversely affected the provision of care to patients. Ancillary support is not modeled in this study).

7. For the purpose of this model, all providers are capable of caring for approximately the same number of patients as their peers on a daily basis without regard to experience level, leadership duties, or additional duties. Although TRICARE Prime panels are based on these individual provider factors, this model is founded on the average provider's productivity capability.

Reliability and Validity

Reliability and validity of this study are dependent upon the accuracy of the collected data and the level of detail of the simulation model. In the first instance, the data was collected in the most reliable method possible, direct observation. The acquisition of OPV data was directly supervised by the FP clinic administrator, and numerous inter-arrival time data collection sheets were spot checked and validated by the

author. Furthermore, the compilation of observations occurred over extended periods (i.e., seven months for OPV data and about one month for inter-arrival times). In addition, the data was gathered on each day of the work week (i.e., Monday through Friday) and at different times of the day (i.e., approximately half were collected during morning clinic hours, and half were collected during afternoon clinic hours). Moreover, the data is considered by the FP clinic administrator and the FP clinic nursing supervisor to be representative of the what actually occurs in the FP clinic. Models must also obtain face validity by verifying that they resemble what was intended (ProModel Corporation 1996). In consultation with the FP clinic administrator, it was determined that this model does resemble the operation of the FP clinic (i.e., the appearance of the animation in the model is like the actual operation of the clinic). This is validated further by the fact that the mean number of patients currently seen in the FP clinic is quite similar to the numbers derived from analyzing the status quo model. In addition, the actual time spent in the clinic and the simulated time spent in the clinic per visit are nearly identical, fifty minutes and fifty-three minutes, respectively. Furthermore, as Law and Kelton suggest is necessary, the model has been accepted as credible by the administrators most closely associated with the family practice clinic (Law and Kelton 1991). The graphic at figure 3 illustrates the validation, verification, and credibility process Law and Kelton recommend, which was used in developing these models.

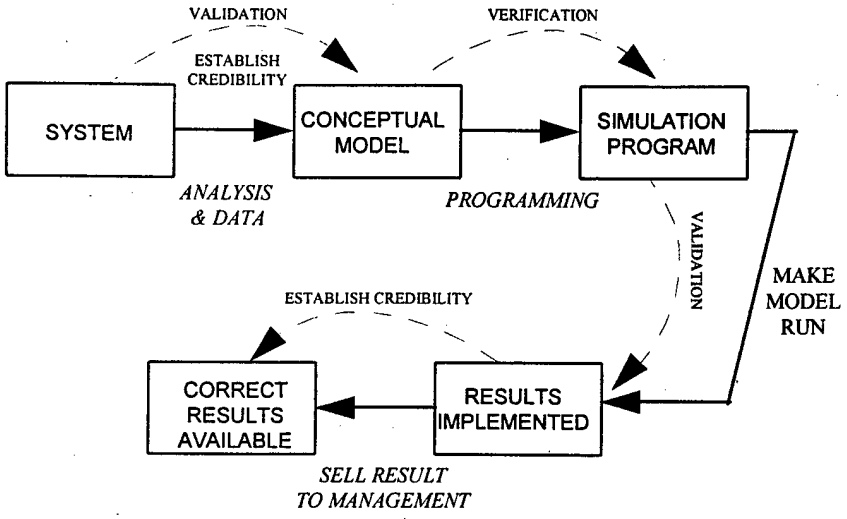

Figure 3. Timing and Relationships of Validation, Verification, and Establishing Credibility (Law and Kelton 1991)

Finally, Lowery stated the level of detail may be determined by four key factors: the time requirements, the availability of data, the modeler's past experience with similar projects, and knowledge of the system (1993). In all areas except past experience, these key factors are answered in a satisfactory manner without qualification.

Ethical Considerations

In order to determine inter-arrival times, patients were asked to record a variety of times during their outpatient clinic visits on a prepared data gathering document. Due to patient confidentiality considerations, patient names, social security numbers, and medical conditions were not requested, recorded, nor discussed. In addition, no attempt

was made to monitor the patients during their visits, except during the screening phase when time observations were collected. This "hands off" approach was utilized to prohibit impeding patient care or making the patients or providers feel uncomfortable. Furthermore, no individual physician productivity data or patient medical condition data was reported or analyzed.

Conclusion

In this section of the paper, results of the simulations are described. Afterwards, a discussion of the available figures is presented. Finally, a recommendation is made.

Results

The first simulation was initially run using the status quo (i.e., current number of patient arrivals and current staffing level). This first effort both validated the model and proved that further study was warranted. This model was run with eight healthcare providers using two exam rooms each and a nursing staff of nine. Run time for this, and subsequent models with a like number of patient arrivals, was about eleven minutes per replication. With twelve replications, a total run time of 2.2 hours per model was experienced. With these parameters, the clinic was capable accommodating 390.08 patients per week. A week was defined as approximately eight hours a day for five days. Of these patients, one was left in the system. Other data derived from the model showed patients experienced an average of 48.85 minutes in the system, which includes a 10.52 minute wait for resources (i.e., provider, nursing staff, screening personnel, or clerk). In addition, the status quo model demonstrated a seven to ten percent utilization rate for examination rooms. Moreover, utilization of resources were at the following levels: 31-35% for providers, 17-45% for nursing staff, 7-23% for clerks, and 35-36% for screening staff.

The TDA model was comprised of six providers with two rooms each and eight nursing staff members. With this configuration, the model was capable of a throughput of 391.42 patients per week. This model left 0.75 patients in the system. In general, the patients experienced a total of 45.99 minutes in the clinic, with 12.89 minutes spent awaiting resources. Further, with this configuration, the model demonstrated that utilization would follow the following pattern: 11-14% for examination rooms, 42-45% for providers, 28-55% for nursing staff, 7-23% for clerks, and around 40% for screening personnel.

The first attempt at an alternate model was configured with six providers with three rooms each and nine nursing staff. This model was capable of providing service to approximately 400.92 patients, with 0.50 patients remaining in the system. In addition, the patients experienced a total time in the clinic of about 46.34 minutes. Of this time, an average of 13.78 minutes was spent waiting on a resource. Furthermore, this model showed an examination room utilization rate of 8-10%, provider utilization of 41-45%, nursing utilization of 28-44%, clerk utilization of 15-24%, and screening staff utilization of 40-41%.

After a thorough analysis of the data from these three models, it was determined that the systems were not adequately tested using the current number (i.e., 79 per day) of patient arrivals. For this reason, all three of these models were run for five day periods with twelve replications each using the following patient arrival figures per day: 100,

120, 130, 140, 150, 175, and 200. In each case, the clinic was capable of handling the vast majority of the patients; however, when patient numbers exceeded 150 patients per day, the total time in the clinic and the total wait for resources became excessive (i.e., much greater than thirty minutes). Therefore, it was decided that further analysis would be made using 150 patient arrivals per day. Several models were then run using this number of arrivals.

The status quo model was the first model run with 150 patients per day. The staffing level remained eight providers and nine nursing personnel. The results of this simulation demonstrated that 735.17 patient could be serviced in one week, with 1.92 patients left in the system. These patients were in the clinic for an average of 64.70 minutes, and waited on resources approximately 17.51 minutes. The utilization figures included: examination room utilization of 17-24%, provider utilization of 57-64%, nursing staff utilization of 46-73%, clerk utilization of 11-38%, and screening personnel utilization of 74-75%. When this simulation was completed, another was run using TDA personnel numbers.

The TDA model, comprised of six providers with two rooms each and 8 nursing personnel, was run for the same period (i.e., twelve separate iterations of a one week period). During this simulation, the clinic was able to provide service to 735 patients with 6.42 remaining in the system. These patients experienced about 110.39 total minutes in the clinic. Of that time, approximately 33.91 minutes was spent awaiting a

resource. Further, with this configuration the following utilization figures were derived: exam rooms were used 31-57% of the time, providers were utilized 71-85% of the time, and nursing staff were used 64-86% of the time. Since the number of arrivals remained constant with this model, the clerks and screening personnel utilization figures remained steady at around 75% and 19-38%, respectively. Having completed the two known models, it was now time to determine what staffing mix could increase access for patients.

The first alternate model tested was Alternate Model A. This model was comprised of 6 providers with three rooms each, and eleven nursing personnel. With this staff configuration about 745.41 patients could be serviced in one week, with 5.17 remaining in the system. In addition, this model demonstrated patients would spend about 86.26 minutes in the clinic for a visit, and would be waiting for resources approximately 37.65 minutes. Furthermore, the model showed exam room utilization of about 26-41%, provider utilization of about 79-84%, and nursing staff utilization of 30-58%. Clerk and screening personnel utilization remained consistent with the previous two models. Having completed Alternate Model A, Alternate Model B was designed.

In Alternate Model B there were six providers with three rooms each and an additional nurse, for a total of twelve nursing personnel. Surprisingly, with the addition of one nurse, the total patients seen dropped to about 725.25 per week. The number of patients remaining in the system average 4.83 in this model, and patients were in the

system approximately 81.22 minutes. During their time in the clinic, patients were waiting for a resource to become available approximately 34.38 minutes. In addition, this model demonstrated an examination room utilization rate of 25-37%, provider utilization of 75-81%, and nursing staff utilization of 26-75%. Again, clerk and screening personnel utilization rates remained consistent with previously run models.

After Alternate Model B was completed, Alternate Model C was designed. This model consisted of six providers with three rooms each and eight nursing staff. In comparison to the TDA model, which is similar except for one less examination room per provider, the model demonstrated that approximately 736.58 patients could be seen in an average week, with about 8.08 being left in the system. In this model total minutes in the system increased to 119.30 and time waiting for resources became on average 55.67 minutes. In addition, Alternate Model C showed utilization rates of 32-59%, 69-87%, and 65-68% for examination rooms, providers, and nursing staff, respectively. Again, utilization figures for screening personnel and clerks remained steady at about 75-76% and 19-29%, respectively. Having completed this model, Alternate Model D was developed.

Alternate Model D consisted of seven providers. Of these providers, four were assigned to three rooms each and three were given two rooms each. The nursing staff in Alternate Model D was set at ten personnel. With this configuration 748.42 patients were able to be seen in a week, with approximately 4.17 remaining in the system. This model

showed that patients would be in the system approximately 73.77 minutes with waits for resources hovering around 27.58 minutes. In addition, utilization figures showed that examination rooms would be used approximately 20-33% of the time, and providers and nurses would have utilization rates of about 61-78% and 47-64%, respectively. Having completed Alternate Model D, it was now time to design and run the seventh and final model.

Alternate Model E was made up of eight providers with two or three rooms each, and nine nursing personnel. This model varies from the status quo model in that several providers are assigned three rooms each instead of all providers having two examination rooms each. This model demonstrated an average of 738.67 patients could be seen with total time spent in the clinic remaining around 67.35 minutes. In addition, the model showed that the average patient would spend about 19.73 minutes awaiting a resource, and only two would be remaining in the system upon shut down. Furthermore, the model demonstrated the following utilization rates: 16-26% for examination rooms, 55-77% for providers, and 56-71% for nursing personnel. Again, clerk and screening personnel utilization rates remained relatively constant at 19-38% and 75%, respectively.

Having completed all ten models, three with 79 patient arrivals and seven models with 150 patient arrivals, it was an appropriate time to analyze all the data. This task was accomplished using basic decision matrices.

Discussion

The initial analysis consisted of comparing the three models with 79 patient arrivals. This was accomplished by placing the pertinent raw data from each of the models in a decision matrix. In this way, the data could be closely examined in a single, simple format. Table 8 illustrates this data.

Model	# of Pt Seen	Pt Left in Sys	Min in Sys	Min Wait for Res	# Prov	# Nurse Staff	# Rooms	Exam Room Util	Prov Util	Nurse Staff Util
Status Quo	390.08	1.00	43.85	10.52	8	9	2	7-10	31-35	17-45
TDA Model	391.42	0.75	45.99	12.89	6	8	2	11-14	42-45	28-55
Alt Model	400.92	0.50	46.34	13.78	6	9	3	8-10	41-45	28-44

Table 8. Raw Data From Models with 79 Patient Arrivals

The next step in analyzing this data was to rank and weight it. The data was ranked in order, one to three, with one being the least desirable outcome and three being the most desirable score. The weighting was designed to give access (i.e., number of patients seen) the highest weight. This factor was set at three. Since waiting time and total time in the clinic are important patient satisfaction areas (Dansky and Miles 1997), they were given weights of two. The rest of the factors, although important, were given a weight of one. These weights were derived by querying the subject matter experts in the

FP clinic, the managed care office, and the quality improvement section. These authorities were asked to rank the factors from most important to least important, and then give each a weighted value. The following table depicts the outcome of the ranking and weighting of data from the three models with 79 patient arrivals.

Model	# Pt Seen	Pt Left in Sys	Min in Sys	Min Wait Res	# Prov	# Nurse Staff	Exam Room Util	Prov Util	Nurse Staff Util	Total
Wt	*3*	*1*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	
SQ	3	1	6	6	1	1	2	1	1	**22**
TDA	6	2	4	4	2	2	1	2	2	**26**
ALT	9	3	2	2	2	1	2	2	2	**25**

Table 9. Ranked and Weighted Data for Models with 79 Patient Arrivals

From the total numbers derived from ranking and weighting the data derived from the three models, one may conclude that the TDA Model is most suited to increasing access to our patients and providing some level of satisfaction. On the other hand, one must note that none of the three models truly taxed the models in that each had additional untapped capacity. Therefore, it was prudent to compare the simulation models which made the system work at a higher tempo. In order to do this, the data derived for models with 150 patient arrivals was placed in a raw data matrix.

Model	# Pt Seen	Pt Left in Sys	Min in Sys	Min Wait Res	# Prov	# Nurse Staff	# Rooms	Exam Room Util	Prov Util	Nurse Staff Util
TDA	735.00	6.42	100.39	33.91	6	8	2	31-57	71-85	64-86
SQ	735.17	1.92	64.70	17.51	8	9	2	17-24	57-64	46-73
ALT A	745.41	5.17	86.26	37.65	6	11	3	24-41	79-84	30-58
ALT B	725.25	4.83	81.22	34.38	6	12	3	25-37	75-81	26-57
ALT C	736.58	8.08	119.30	55.67	6	8	3	32-59	69-87	65-68
ALT D	748.42	4.17	73.77	27.58	7	10	2/3	20-33	61-78	47-64
ALT E	738.67	2.00	67.35	19.73	8	9	2/3	16-26	55-77	56-71

Table 10. Raw Data from Models with 150 Patient Arrivals

The raw data from table 10 was then ranked and weighted. The rankings were from one to seven, with one being the least desirable and seven being the most desirable outcome. The weights were assigned in a like fashion to table 9. The number of patients seen in one week's time was given a weight of three, and total minutes spent in the clinic and time spent awaiting a resource were both given a weight of two. The remaining categories were given a weighted value of one. The following matrix shows the results of the ranking and weighting.

Model	# Pt Seen	Pt Left in Sys	Min in Sys	Min Wait Res	# Prov	# Nurse Staff	Exam Room Util	Prov Util	Nurse Staff Util	Total
Weight	*3*	*1*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	
TDA	6	2	4	8	3	5	6	4	7	**45**
SQ	9	7	14	14	1	4	2	1	4	**56**
ALT A	18	3	6	4	3	2	5	6	2	**49**
ALT B	3	4	8	6	3	1	4	5	1	**35**
ALT C	12	1	2	2	3	5	7	4	5	**41**
ALT D	21	5	10	10	2	3	3	3	3	**60**
ALT E	15	6	12	12	1	4	1	2	6	**59**

Table 11. Ranked and Weighted Data for Models with 150 Patient Arrivals

As demonstrated by the decision matrix at table 11, a number of the models have obvious superior characteristics. The models, ranked in order from best to worst are: 1) Alternate Model D, 2) Alternate Model E, 3) Status Quo Model, 4) Alternate Model A, 5) TDA Model, 6) Alternate Model C, and 7) Alternate Model B. The exceptional qualities of the highest ranked models are derived from appropriate staff levels, which, in turn, contribute greatly to access of the clinic by patients. For this reason hypotheses Model

1: Status Quo Model and Model 2: TDA Model are rejected. Conversely, the study fails to reject the hypothesis for Model 3: Alternate Model.

Recommendations

As mentioned previously, there is no single best answer to most questions. That is the case in this study, too. A number of the models studied in this paper provide satisfactory patient access to BJACH family practice providers. The superlative one, however, has been determined to be Alternate Model D. Therefore, Alternate Model D is recommended. As stated earlier, Alternate Model D utilizes seven providers with two or three rooms each and ten nursing staff members. Since half the clinic was modeled, the total staff level recommended for the family practice clinic is fourteen providers and twenty nursing personnel. The current staff is comprised of seventeen providers and nineteen nursing personnel. The net difference is fewer providers and slightly more nursing staff members. This difference may account for a significant savings in personnel costs if the model is accepted. In addition, Alternate Model D allowed the most access to patients, as well as shorter total times in the clinic and less time waiting for resources than most of the other models. It must be stressed again, however, that this recommendation is based on a theoretical patient load of approximately 300 patients per day when there is a full complement of staff. With current staff levels the clinic is only accommodating about 160 patients per day. A full appointment template has 357 appointments accessible when there are seventeen providers available (17 providers x 21

appointments each = 357 total appointments per day). Much of this difference may be accounted for by providers having additional duties (e.g., ER, call, TMC, meetings), normal leave, emergencies, temporary duty, training, continuing medical education, and other normal distractions. Some of the variance, however, is not accounted for.

Another finding from this study is that the current system is capable of handling many more patients than it is currently. This conclusion has a direct correlation with the findings in Tanner's research. It is therefore recommended that further study and analysis on productivity be performed.

Additionally, it is recommended that the findings from recent research by Dansky and Miles (1997) be examined closely by family practice clinic personnel. From this research, the staff may find ways to enhance patient satisfaction. Specifically, patients should be informed of the amount of wait to expect, and notified when an emergency or other complication arises which may make their wait longer than at first expected. In addition, patients should be provided with some sort of entertainment. Currently, the hospital provides only a newscast and educational materials. To increase patient satisfaction, it may be prudent to provide appropriate reading material, alternate educational programming, and children's books and other entertainment for our young customers.

Although these recommendations will not solve all of our access or satisfaction problems in the family practice clinic, they will, if implemented, improve the current system. While our system functions as it is, it is not now, and never will be, perfect.

However, it is incumbent upon us, the staff of BJACH, to continue to seek ways to improve the way we provide care to our beneficiaries. In the future we should examine other patient satisfaction areas such as how long it takes patients to get an appointment, how long does it takes to get through on a phone line, and does the patient see the assigned primary care provider. This is essential because we exist as an institution to serve our beneficiaries. Our customers have earned the best care that we can provide them within the constraints we are given. In addition, the staff of this hospital deserves the best support from each other. To that end, we must work as a team to grow as an institution. If we practice this philosophy, "We provide the best . . . " will no longer be a mere slogan. It will, in fact, become a way of life.

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Annex A Observed and Collected Data and Other Information

Annex A Observed and Collected Data

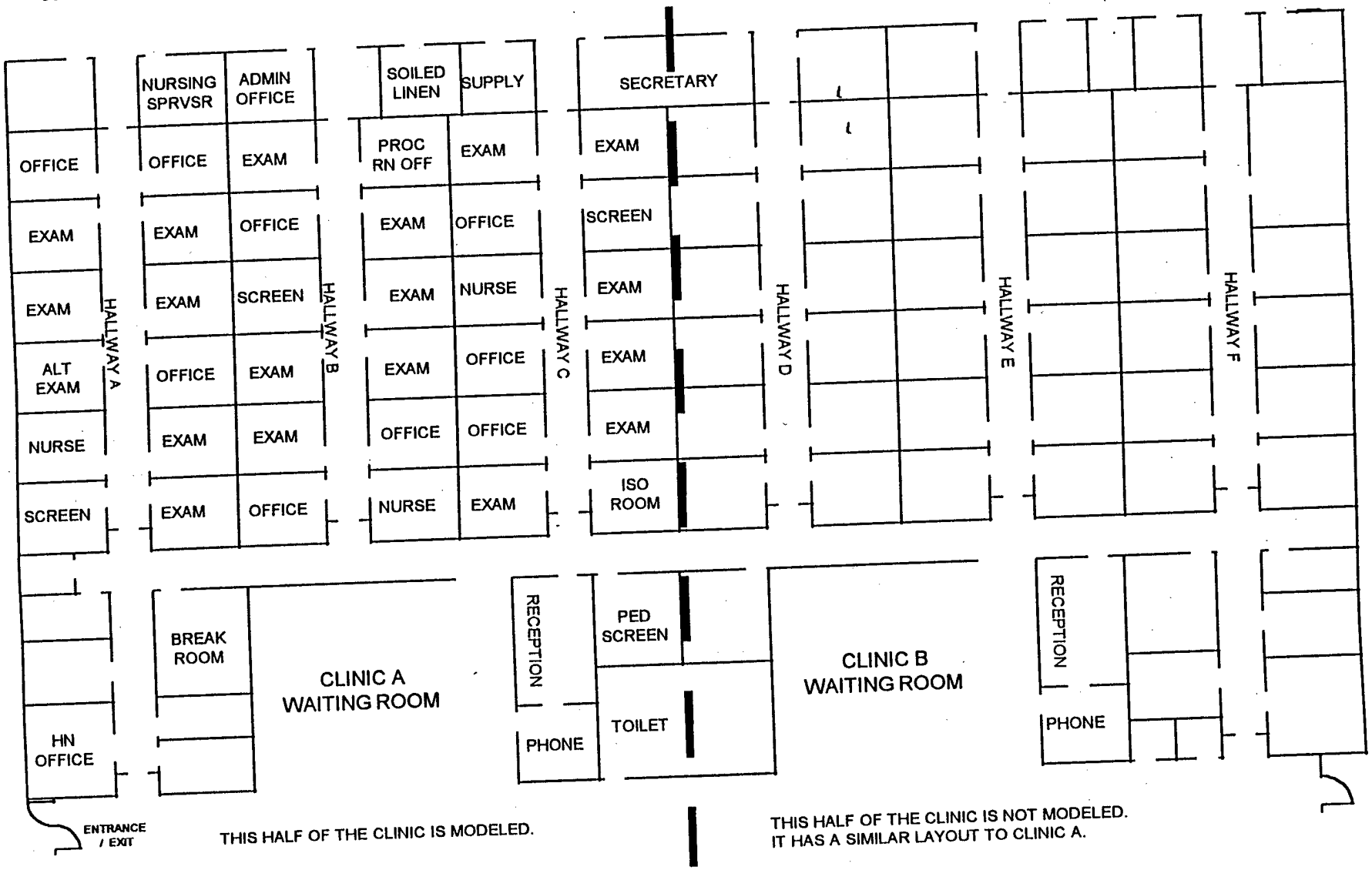
A-3 Family Practice Outpatient Visit Data

month	# pt seen/ mo	days avail in mo	pt seen / day	half clinic
May-96	3262	23	141.83	70.91
Jun-96	2935	20	146.75	73.38
Jul-96	3491	21	166.24	83.12
Aug-96	3482	22	158.27	79.14
Sep-96		Not Available		
Oct-96	3797	21	180.81	90.40
Nov-96	2640	17	155.29	77.65

daily mean for half clinic
79.10

Annex A Observed and Collected Data and Other Information

A-1 Annotated Diagram of the Family Practice Clinic



Annex A Observed and Collected Data and Other Information
A-2 Example Data Collection Sheet

We want to improve so we can better serve you and our other deserving beneficiaries. In order to do this we need to know how we're doing. Please help us by completing the form below.

Please fill in the blank with the appropriate answer.

1. Today's date is: (*day month year*) _____.
My appointment time is: (time) _____.

2. I arrived at the family practice clinic reception desk at:
(*time*) _____.

3. I departed the reception desk at: (*time*) _____.

4. I was called for screening (temperature, blood pressure, etc.) at:
(*time*) _____.

5. I departed the screening room at: (*time*) _____.

6. I was called to an examining room at: (*time*) _____.

7. I was seen by a healthcare provider at: (*time*)
_____.

8. I was released by the provider at: (*time*) _____.

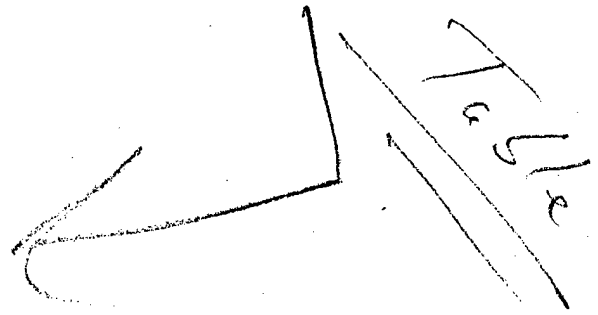
9. Please add any comments on the back of the form.

Thank you for your patronage! Have a nice day!

Annex A Observed and Collected Data and Other Information
A-3 Family Practice Outpatient Visit Data

month	# pt seen/ mo	days avail in mo	pt seen / day	half clinic
Nov-96	2640	17	155.29	77.65
Oct-96	3797	21	180.81	90.40
Aug-96	3482	22	158.27	79.14
Jul-96	3491	21	166.24	83.12
Jun-96	2935	20	146.75	73.38
May-96	3262	23	141.83	70.91

daily mean for half clinic
79.10



Annex A Observed and Collected Data and Other Information

A-4 Family Practice Inter-arrival and Service Time Data

Date	Appt	Early Arr	Arr Recpt	Recpt	Dpt Recpt	Wait Scr	Arr Scr	Scr Time	Dpt Scr	WtGoEx	Arr Ex	WtInEx	ProvArr	DptEx	w/Prov	Tot Time	
16-Jan	09:45	00:15:00	09:30:00	00:01:29	09:31:29	00:08:31	09:40:00	00:04:32	09:44:32	00:00:28	09:45	00:15	10:00	10:25	00:25	00:55	00:50 mean time clinic
16-Jan	13:45	00:37:00	13:08:00	00:01:00	13:09:00	00:06:00	13:15:00	00:03:50	13:18:50	00:01:10	13:20	00:02	13:22	13:32	00:10	00:24	00:25 stddev
16-Jan	09:30	00:15:00	09:15:00	00:02:01	09:17:01	00:08:59	09:26:00	00:06:45	09:32:45	00:00:15	09:33	00:07	09:40	09:55	00:15	00:40	
16-Jan	08:00	00:01:00	07:59:00	00:01:10	08:00:10	00:29:50	08:30:00	00:04:23	08:34:23	00:05:37	08:40	00:05	08:45	08:55	00:10	00:56	
16-Jan	09:30	00:05:00	09:25:00	00:01:00	09:26:00	00:04:00	09:30:00	00:06:35	09:36:35	00:00:25	09:37	00:00	09:37	09:45	00:08	00:20	
16-Jan	13:00	00:02:00	12:58:00	00:00:45	12:58:45	00:11:15	13:10:00	00:03:45	13:13:45	00:06:15	13:20	00:10	13:30	13:40	00:10	00:42	
16-Jan	13:30	00:45:00	12:45:00	00:01:35	12:46:35	00:03:25	12:50:00	00:03:56	12:53:56	00:00:04	12:54	00:21	13:15	13:40	00:25	00:55	
16-Jan	10:15	00:30:00	09:45:00	00:02:01	09:47:01	00:07:59	09:55:00	00:04:13	09:59:13	00:00:47	10:00	00:10	10:10	10:20	00:10	00:35	
16-Jan	09:45	00:15:00	09:30:00	00:01:54	09:31:54	00:03:06	09:35:00	00:05:25	09:40:25	00:00:35	09:41	00:04	09:45	10:10	00:25	00:40	
16-Jan	08:00	00:10:00	07:50:00	00:01:29	07:51:29	00:03:31	07:55:00	00:07:09	08:02:09	00:02:51	08:05	00:00	08:05	08:45	00:40	00:55	
16-Jan	08:00	00:06:00	07:54:00	00:01:56	07:55:56	00:04:04	08:00:00	00:05:24	08:05:24	00:04:36	08:10	00:01	08:11	08:21	00:10	00:27	
16-Jan	08:40	00:19:00	08:21:00	00:02:00	08:23:00	00:06:00	08:29:00	00:03:25	08:32:25	00:00:35	08:33	00:19	08:52	08:55	00:03	00:34	
16-Jan	15:30	02:10:00	13:20:00	00:01:31	13:21:31	00:00:29	13:22:00	00:06:43	13:28:43	00:31:17	14:00	00:15	14:15	14:25	00:10	01:05	
16-Jan	14:00	00:10:00	13:50:00	00:01:09	13:51:09	00:01:51	13:53:00	00:06:53	13:59:53	00:35:07	14:35	00:19	14:54	14:55	00:01	01:05	
17-Jan	14:30	00:20:00	14:10:00	00:02:17	14:12:17	00:07:43	14:20:00	00:04:29	14:24:29	00:00:31	14:25	01:05	15:30	15:45	00:15	01:35	
21-Jan	15:45	00:20:00	15:25:00	00:01:51	15:26:51	00:08:09	15:35:00	00:05:21	15:40:21	00:00:39	15:41	00:34	16:15	16:30	00:15	01:05	
21-Jan	11:30	00:15:00	11:15:00	00:01:49	11:16:49	00:03:11	11:20:00	00:03:15	11:23:15	00:01:45	11:25	00:00	11:25	11:35	00:10	00:20	
21-Jan	11:00	00:15:00	10:45:00	00:02:56	10:47:56	00:07:04	10:55:00	00:04:15	10:59:15	01:35:45	12:35	00:00	12:35	12:45	00:10	02:00	
21-Jan	14:30	00:26:00	14:04:00	00:01:20	14:05:20	00:01:40	14:07:00	00:06:51	14:13:51	00:06:09	14:20	00:10	14:30	14:45	00:15	00:41	
21-Jan	11:00	00:30:00	10:30:00	00:01:26	10:31:26	00:18:34	10:50:00	00:07:11	10:57:11	00:00:49	10:58	00:02	11:00	11:55	00:55	01:25	
21-Jan	10:45	00:05:00	10:40:00	00:01:39	10:41:39	00:03:21	10:45:00	00:08:12	10:53:12	00:00:48	10:54	00:01	10:55	11:35	00:40	00:55	
21-Jan	11:30	00:25:00	11:05:00	00:01:45	11:06:45	00:08:15	11:15:00	00:03:45	11:18:45	00:17:15	11:36	00:04	11:40	12:07	00:27	01:02	
21-Jan	15:00	00:19:00	14:41:00	00:02:45	14:43:45	00:02:15	14:46:00	00:05:28	14:51:28	00:14:32	15:06	00:10	15:16	15:18	00:02	00:37	
21-Jan	15:00	00:15:00	14:45:00	00:01:31	14:46:31	00:03:29	14:50:00	00:06:21	14:56:21	00:00:39	14:57	00:43	15:40	15:43	00:03	00:58	
21-Jan	14:00	00:15:00	13:45:00	00:01:56	13:46:56	00:13:04	14:00:00	00:04:21	14:04:21	00:03:39	14:08	00:07	14:15	14:30	00:15	00:45	
21-Jan	08:30	00:05:00	08:25:00	00:00:59	08:25:59	00:04:01	08:30:00	00:04:54	08:34:54	00:00:06	08:35	00:05	08:40	08:50	00:10	00:25	
21-Jan	11:15	00:20:00	10:55:00	00:01:44	10:56:44	00:04:16	11:01:00	00:05:23	11:06:23	00:00:37	11:07	00:13	11:20	11:30	00:10	00:35	
21-Jan	14:00	00:20:00	13:40:00	00:01:24	13:41:24	00:13:36	13:55:00	00:08:24	14:01:24	00:00:36	14:02	00:08	14:10	14:20	00:10	00:40	
21-Jan	14:00	01:01:00	12:59:00	00:01:24	13:00:24	00:00:36	13:01:00	00:07:54	13:08:54	00:06:06	13:15	00:45	14:00	14:10	00:10	01:11	
21-Jan	14:00	00:00:00	14:00:00	00:02:32	14:02:32	00:02:28	14:05:00	00:04:59	14:09:59	00:00:01	14:10	00:15	14:25	14:50	00:25	00:50	
21-Jan	14:15	00:22:00	13:53:00	00:01:26	13:54:26	00:10:34	14:05:00	00:07:21	14:12:21	00:02:39	14:15	00:35	14:50	15:15	00:25	01:22	

Annex A Observed and Collected Data and Other Information

A-4 Family Practice Inter-arrival and Service Time Data

21-Jan	15:30	00:30:00	15:00:00	00:01:03	15:01:03	00:33:57	15:35:00	00:04:50	15:39:50	00:00:10	15:40	00:05	15:45	15:55	00:10	00:55
22-Jan	14:00	00:20:00	13:40:00	00:02:39	13:42:39	00:22:21	14:05:00	00:05:28	14:10:28	00:04:32	14:15	00:05	14:20	14:30	00:10	00:50
23-Jan	15:15	00:25:00	14:50:00	00:01:28	14:51:28	00:03:32	14:55:00	00:05:27	15:00:27	00:00:33	15:01	00:09	15:10	15:12	00:02	00:22
23-Jan	14:45	00:43:00	15:28:00	00:03:00	15:31:00	00:02:00	15:33:00	00:08:31	15:41:31	00:00:29	15:42	00:00	15:42	15:52	00:10	00:24
23-Jan	15:00	00:00:00	15:00:00	00:02:03	15:02:03	00:17:57	15:20:00	00:05:28	15:25:28	00:00:32	15:26	00:04	15:30	15:40	00:10	00:40
23-Jan	16:00	00:20:00	15:40:00	00:01:56	15:41:56	00:08:04	15:50:00	00:06:22	15:56:22	00:00:38	15:57	00:03	16:00	16:10	00:10	00:30
23-Jan	14:45	00:07:00	14:38:00	00:01:27	14:39:27	00:03:33	14:43:00	00:06:01	14:49:01	00:00:59	14:50	00:05	14:55	15:05	00:10	00:27
26-Jan	14:30	00:15:00	14:15:00	00:01:21	14:16:21	00:43:39	15:00:00	00:08:43	15:08:43	00:06:17	15:15	00:00	15:15	15:20	00:05	01:05
27-Jan	09:45	00:15:00	09:30:00	00:01:29	09:31:29	00:15:31	09:47:00	00:04:32	09:51:32	00:08:28	10:00	00:05	10:05	10:35	00:30	01:05
27-Jan	10:15	00:30:00	09:45:00	00:01:00	09:46:00	00:13:00	09:59:00	00:03:50	10:02:50	00:18:10	10:21	00:06	10:27	11:30	01:03	01:45
27-Jan	10:45	00:15:00	10:30:00	00:02:01	10:32:01	00:07:59	10:40:00	00:06:45	10:46:45	00:00:15	10:47	00:03	10:50	11:05	00:15	00:35
27-Jan	10:00	00:12:00	09:48:00	00:01:10	09:49:10	00:00:50	09:50:00	00:04:23	09:54:23	00:00:37	09:55	00:00	09:55	10:03	00:08	00:15
27-Jan	09:30	00:30:00	09:00:00	00:01:00	09:01:00	00:15:00	09:16:00	00:06:35	09:22:35	00:07:25	09:30	00:05	09:35	10:00	00:25	01:00
27-Jan	09:15	00:15:00	09:00:00	00:00:45	09:00:45	00:24:15	09:25:00	00:03:45	09:28:45	00:00:15	09:29	00:01	09:30	09:46	00:16	00:46
27-Jan	10:00	00:02:00	10:02:00	00:01:35	10:03:35	00:06:25	10:10:00	00:03:56	10:13:56	00:00:04	10:14	00:21	10:35	10:40	00:05	00:38
27-Jan	09:00	00:05:00	09:05:00	00:02:01	09:07:01	00:02:59	09:10:00	00:04:13	09:14:13	00:00:47	09:15	00:02	09:17	09:21	00:04	00:16
27-Jan	10:00	00:30:00	09:30:00	00:01:54	09:31:54	00:08:06	09:40:00	00:05:25	09:45:25	00:00:35	09:46	00:14	10:00	10:20	00:20	00:50
27-Jan	10:00	00:10:00	09:50:00	00:01:29	09:51:29	00:03:31	09:55:00	00:07:09	10:02:09	00:02:51	10:05	00:19	10:24	10:39	00:15	00:49
27-Jan	10:30	00:30:00	10:00:00	00:01:56	10:01:56	00:28:04	10:30:00	00:05:24	10:35:24	00:00:36	10:36	00:02	10:38	11:15	00:37	01:15
27-Jan	09:45	00:28:00	09:17:00	00:02:00	09:19:00	00:14:00	09:33:00	00:03:25	09:36:25	00:16:35	09:53	00:02	09:55	09:56	00:01	00:39
27-Jan	10:00	00:20:00	09:40:00	00:01:31	09:41:31	00:03:29	09:45:00	00:06:43	09:51:43	00:00:17	09:52	00:08	10:00	10:15	00:15	00:35
27-Jan	09:30	00:05:00	09:25:00	00:01:09	09:26:09	00:03:51	09:30:00	00:06:53	09:36:53	00:03:07	09:40	00:06	09:46	09:58	00:12	00:33
27-Jan	10:00	00:10:00	09:50:00	00:02:17	09:52:17	00:02:43	09:55:00	00:04:29	09:59:29	00:00:31	10:00	00:25	10:25	10:32	00:07	00:42
27-Jan	11:15	00:19:00	10:56:00	00:01:51	10:57:51	00:11:09	11:09:00	00:05:21	11:14:21	00:00:39	11:15	00:15	11:30	11:40	00:10	00:44
27-Jan	09:30	00:15:00	09:15:00	00:01:49	09:16:49	00:08:11	09:25:00	00:03:15	09:28:15	00:01:45	09:30	00:05	09:35	09:45	00:10	00:30
27-Jan	09:55	00:05:00	09:50:00	00:02:56	09:52:56	00:12:04	10:05:00	00:04:15	10:09:15	00:30:45	10:40	00:15	10:55	11:05	00:10	01:15
28-Jan	10:15	00:00:00	10:15:00	00:01:20	10:16:20	00:03:40	10:20:00	00:06:51	10:26:51	00:00:09	10:27	00:03	10:30	10:45	00:15	00:30
28-Jan	09:45	00:07:00	09:38:00	00:01:26	09:39:26	00:05:34	09:45:00	00:07:11	09:52:11	00:00:49	09:53	00:02	09:55	10:00	00:05	00:22
28-Jan	09:30	00:10:00	09:20:00	00:01:39	09:21:39	00:02:21	09:24:00	00:08:12	09:32:12	00:00:48	09:33	00:07	09:40	09:55	00:15	00:35
28-Jan	11:00	00:20:00	10:40:00	00:01:45	10:41:45	00:09:15	10:51:00	00:03:45	10:54:45	00:00:15	10:55	00:20	11:15	11:30	00:15	00:50
28-Jan	11:00	00:25:00	10:35:00	00:02:45	10:37:45	00:02:15	10:40:00	00:05:28	10:45:28	00:09:32	10:55	00:25	11:20	11:25	00:05	00:50
28-Jan	10:00	00:30:00	09:30:00	00:01:31	09:31:31	00:18:29	09:50:00	00:06:21	09:56:21	00:13:39	10:10	00:30	10:40	11:00	00:20	01:30

Annex A Observed and Collected Data and Other Information

A-4 Family Practice Inter-arrival and Service Time Data

28-Jan	11:30	00:32:00	10:58:00	00:01:56	10:59:56	00:05:04	11:05:00	00:04:21	11:09:21	00:00:39	11:10	00:10	11:20	11:30	00:10	00:32
28-Jan	13:30	00:10:00	13:20:00	00:00:59	13:20:59	00:10:01	13:31:00	00:04:54	13:35:54	00:00:06	13:36	00:04	13:40	13:45	00:05	00:25
28-Jan	10:15	00:20:00	09:55:00	00:01:44	09:56:44	00:03:16	10:00:00	00:05:23	10:05:23	00:00:37	10:06	00:04	10:10	10:20	00:10	00:25
28-Jan	10:30	00:15:00	10:15:00	00:01:24	10:16:24	00:03:36	10:20:00	00:06:24	10:26:24	00:00:36	10:27	00:13	10:40	10:50	00:10	00:35
28-Jan	11:30	00:39:00	10:51:00	00:01:24	10:52:24	00:00:36	10:53:00	00:07:54	11:00:54	00:00:06	11:01	00:04	11:05	11:15	00:10	00:24
28-Jan	11:15	00:25:00	10:50:00	00:02:32	10:52:32	00:07:28	11:00:00	00:04:59	11:04:59	00:55:01	12:00	00:00	12:00	12:10	00:10	01:20
28-Jan	11:45	00:25:00	11:20:00	00:01:26	11:21:26	00:15:34	11:37:00	00:07:21	11:44:21	00:00:39	11:45	00:20	12:05	12:18	00:13	00:58
28-Jan	13:30	00:20:00	13:10:00	00:01:03	13:11:03	00:13:57	13:25:00	00:04:50	13:29:50	00:30:10	14:00	00:10	14:10	14:25	00:15	01:15
28-Jan	14:45	00:05:00	14:40:00	00:02:39	14:42:39	00:02:21	14:45:00	00:05:28	14:50:28	00:00:32	14:51	00:01	14:52	14:52	00:00	00:12
28-Jan	14:15	00:15:00	14:00:00	00:01:28	14:01:28	00:06:32	14:08:00	00:05:27	14:13:27	00:00:33	14:14	00:16	14:30	14:41	00:11	00:41
28-Jan	14:15	00:10:00	14:05:00	00:03:00	14:08:00	00:07:00	14:15:00	00:08:31	14:23:31	00:00:29	14:24	00:06	14:30	14:40	00:10	00:35
28-Jan	14:00	01:00:00	13:00:00	00:02:03	13:02:03	00:17:57	13:20:00	00:05:28	13:25:28	00:04:32	13:30	01:21	14:51	15:00	00:09	02:00
28-Jan	14:30	00:25:00	14:05:00	00:01:56	14:06:56	00:08:04	14:15:00	00:06:22	14:21:22	00:05:38	14:27	00:03	14:30	14:40	00:10	00:35
28-Jan	14:00	00:15:00	13:45:00	00:01:27	13:46:27	00:13:33	14:00:00	00:06:01	14:06:01	00:03:59	14:10	00:10	14:20	14:30	00:10	00:45
28-Jan	13:30	00:15:00	13:15:00	00:01:21	13:16:21	00:03:39	13:20:00	00:08:43	13:28:43	00:00:17	13:29	00:21	13:50	14:05	00:15	00:50
28-Jan	13:45	00:45:00	13:00:00	00:00:45	13:00:45	00:14:15	13:15:00	00:04:32	13:19:32	01:40:28	15:00	00:50	15:50	16:00	00:10	03:00
28-Jan	15:00	00:20:00	14:40:00	00:01:35	14:41:35	00:14:25	14:56:00	00:03:50	14:59:50	00:00:10	15:00	00:05	15:05	15:15	00:10	00:35
28-Jan	15:00	00:40:00	14:20:00	00:02:01	14:22:01	00:07:59	14:30:00	00:06:45	14:36:45	00:00:15	14:37	00:13	14:50	15:00	00:10	00:40
28-Jan	14:15	00:25:00	13:50:00	00:01:54	13:51:54	01:08:06	15:00:00	00:04:23	15:04:23	00:00:37	15:05	00:10	15:15	15:33	00:18	01:43
28-Jan	14:45	00:15:00	14:30:00	00:01:29	14:31:29	00:03:31	14:35:00	00:06:35	14:41:35	00:13:25	14:55	00:20	15:15	15:30	00:15	01:00
28-Jan	14:45	00:20:00	14:25:00	00:01:56	14:26:56	00:33:04	15:00:00	00:03:45	15:03:45	00:11:15	15:15	00:15	15:30	15:50	00:20	01:25
28-Jan	15:15	00:15:00	15:00:00	00:02:00	15:02:00	00:28:00	15:30:00	00:03:56	15:33:56	00:00:04	15:34	00:00	15:34	16:10	00:36	01:10
28-Jan	15:30	00:10:00	15:20:00	00:01:31	15:21:31	00:13:29	15:35:00	00:04:13	15:39:13	00:00:47	15:40	00:05	15:45	16:00	00:15	00:40
28-Jan	15:45	00:40:00	15:05:00	00:01:09	15:06:09	00:13:51	15:20:00	00:05:25	15:25:25	00:00:35	15:26	00:39	16:05	16:20	00:15	01:15
28-Jan	14:30	00:30:00	14:00:00	00:02:17	14:02:17	00:02:43	14:05:00	00:07:09	14:12:09	00:32:51	14:45	00:25	15:10	15:25	00:15	01:25
28-Jan	16:00	00:15:00	15:45:00	00:01:51	15:46:51	00:17:09	16:04:00	00:05:24	16:09:24	00:00:36	16:10	00:20	16:30	16:40	00:10	00:55
28-Jan	11:00	00:12:00	10:48:00	00:01:49	10:49:49	00:10:11	11:00:00	00:03:25	11:03:25	00:01:35	11:05	00:05	11:10	11:30	00:20	00:42
29-Jan	10:15	00:05:00	10:10:00	00:02:56	10:12:56	00:10:04	10:23:00	00:06:43	10:29:43	00:10:17	10:40	00:20	11:00	11:05	00:05	00:55
29-Jan	08:45	00:20:00	08:25:00	00:01:20	08:26:20	00:13:40	08:40:00	00:06:53	08:46:53	00:00:07	08:47	00:03	08:50	09:00	00:10	00:35
29-Jan	08:30	00:10:00	08:20:00	00:01:26	08:21:26	00:00:34	08:22:00	00:04:29	08:26:29	00:04:31	08:31	00:00	08:31	08:40	00:09	00:20
29-Jan	08:10	00:10:00	08:00:00	00:01:39	08:01:39	00:13:21	08:15:00	00:05:21	08:20:21	00:00:39	08:21	00:04	08:25	09:20	00:55	01:20
29-Jan	09:15	00:15:00	09:00:00	00:01:45	09:01:45	00:03:15	09:05:00	00:03:15	09:08:15	00:00:45	09:09	00:02	09:11	09:20	00:09	00:20

Annex A Observed and Collected Data and Other Information

A-4 Family Practice Inter-arrival and Service Time Data

29-Jan	10:30	00:23:00	10:07:00	00:02:45	10:09:45	00:05:15	10:15:00	00:04:15	10:19:15	00:17:45	10:37	00:28	11:05	11:10	00:05	01:03
29-Jan	08:30	00:30:00	08:00:00	00:01:31	08:01:31	00:13:29	08:15:00	00:06:51	08:21:51	00:00:09	08:22	00:28	08:50	09:00	00:10	01:00
29-Jan	09:30	00:10:00	09:20:00	00:01:56	09:21:56	00:18:04	09:40:00	00:07:11	09:47:11	00:00:49	09:48	00:17	10:05	10:40	00:35	01:20
29-Jan	10:00	00:20:00	09:40:00	00:00:59	09:40:59	00:19:01	10:00:00	00:08:12	10:08:12	00:00:48	10:09	00:00	10:09	10:12	00:03	00:32
29-Jan	08:45	00:15:00	08:30:00	00:01:44	08:31:44	00:03:16	08:35:00	00:03:45	08:38:45	00:01:15	08:40	00:05	08:45	09:15	00:30	00:45
29-Jan	09:30	00:15:00	09:15:00	00:01:24	09:16:24	00:13:36	09:30:00	00:05:28	09:35:28	00:04:32	09:40	00:00	09:40	10:00	00:20	00:45
29-Jan	09:45	00:20:00	09:25:00	00:01:24	09:26:24	00:08:36	09:35:00	00:06:21	09:41:21	00:00:39	09:42	00:08	09:50	10:00	00:10	00:35
29-Jan	09:30	00:16:00	09:14:00	00:02:32	09:16:32	00:13:28	09:30:00	00:04:21	09:34:21	00:00:39	09:35	00:10	09:45	10:00	00:15	00:46
31-Jan	09:30	00:15:00	09:15:00	00:01:26	09:16:26	00:23:34	09:40:00	00:04:54	09:44:54	00:00:06	09:45	00:15	10:00	10:25	00:25	01:10
5-Feb	10:00	00:41:00	09:19:00	00:01:03	09:20:03	00:02:57	09:23:00	00:05:23	09:28:23	00:00:37	09:29	00:19	09:48	09:50	00:02	00:31
5-Feb	10:00	00:13:00	09:47:00	00:02:39	09:49:39	00:00:21	09:50:00	00:06:24	09:56:24	00:00:36	09:57	00:03	10:00	10:09	00:09	00:22
5-Feb	10:00	00:05:00	09:55:00	00:01:28	09:56:28	00:12:32	10:09:00	00:07:54	10:16:54	00:00:06	10:17	00:01	10:18	10:21	00:03	00:26
5-Feb	09:15	00:10:00	09:05:00	00:03:00	09:08:00	00:02:00	09:10:00	00:04:59	09:14:59	00:00:01	09:15	00:10	09:25	09:30	00:05	00:25
5-Feb	10:30	00:30:00	10:00:00	00:02:03	10:02:03	00:02:57	10:05:00	00:07:21	10:12:21	00:07:39	10:20	00:20	10:40	10:50	00:10	00:50
5-Feb	08:30	00:25:00	08:05:00	00:01:56	08:06:56	00:08:04	08:15:00	00:04:50	08:19:50	00:05:10	08:25	00:00	08:25	08:50	00:25	00:45
5-Feb	09:15	00:20:00	08:55:00	00:01:27	08:56:27	00:11:33	09:08:00	00:05:28	09:13:28	00:34:32	09:48	00:36	10:24	10:37	00:13	01:42
5-Feb	11:00	00:20:00	10:40:00	00:01:21	10:41:21	00:03:39	10:45:00	00:05:27	10:50:27	00:01:33	10:52	00:13	11:05	11:15	00:10	00:35
5-Feb	10:30	00:15:00	10:15:00	00:00:45	10:15:45	00:09:15	10:25:00	00:08:31	10:33:31	00:00:29	10:34	00:06	10:40	11:17	00:37	01:02
5-Feb	10:45	00:05:00	10:40:00	00:01:35	10:41:35	00:08:25	10:50:00	00:05:28	10:55:28	00:04:32	11:00	00:10	11:10	11:30	00:20	00:50
5-Feb	10:45	00:15:00	10:30:00	00:02:01	10:32:01	00:12:59	10:45:00	00:06:22	10:51:22	00:00:38	10:52	00:17	11:09	11:26	00:17	00:56
5-Feb	15:00	00:15:00	14:45:00	00:01:54	14:46:54	00:00:06	14:47:00	00:06:01	14:53:01	00:51:59	15:45	00:00	15:45	16:10	00:25	01:25
5-Feb	10:00	00:10:00	09:50:00	00:01:29	09:51:29	00:13:31	10:05:00	00:08:43	10:13:43	00:00:17	10:14	00:01	10:15	10:30	00:15	00:40
5-Feb	09:45	00:27:00	09:18:00	00:01:56	09:19:56	00:00:04	09:20:00	00:06:21	09:26:21	00:02:39	09:29	00:04	09:33	09:49	00:16	00:31
6-Feb	09:00	00:10:00	08:50:00	00:02:00	08:52:00	00:13:00	09:05:00	00:03:34	09:08:34	00:01:26	09:10	00:10	09:20	09:40	00:20	00:50
6-Feb	08:30	00:20:00	08:10:00	00:01:31	08:11:31	00:03:29	08:15:00	00:05:31	08:20:31	00:07:29	08:28	00:02	08:30	09:00	00:30	00:50

Annex A Observed and Collected Data and Other Information
A-5 Family Practice Clinic Arrival Cycles

Number of Cases	Appt Time	Cases in Period	Percent	Daily Avg (80 visits)
3	08:00			
1	08:10			
5	08:30	12	10.00%	8
1	08:40			
2	08:45			
2	09:00			
4	09:15			
10	09:30	24	20.00%	16
7	09:45			
1	09:55			
12	10:00			
5	10:15			
5	10:30	26	21.67%	17
4	10:45			
6	11:00			
3	11:15	14	11.67%	9
4	11:30			
1	11:45			
No Appt 1200-1300				
1	13:00			
4	13:30	7	5.83%	5
2	13:45			
8	14:00			
4	14:15	22	18.33%	15
5	14:30			
5	14:45			
6	15:00			
2	15:15	13	10.83%	9
3	15:30			
2	15:45			
2	16:00	2	1.67%	1
120		120	100.00%	80

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
*******************************************************************************
*                                                                             *
*                    Formatted Listing of Model:                              *
*                    C:\NEAL\GMP\GMPMEDMO\STAQUO.MOD                          *
*                                                                             *
*******************************************************************************
```

Time Units: Minutes
Distance Units: Feet
Initialization Logic: ACTIVATE _hr_24clock ()

```
*******************************************************************************
*                          Locations                                          *
*******************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
*******************************************************************************
*                    Clock downtimes for Locations                            *
*******************************************************************************

 Lcc       Frequency   First Time   Priority   Scheduled Disable Logic
 --------- ----------- ----------- ---------- --------- ------ ----------------
 entrance  24hr        9hr         99         Yes       No     WAIT 10 HR


*******************************************************************************
*                          Entities                                           *
*******************************************************************************

 Name      Speed (fpm)  Stats
 --------- ----------- ---------
 patient   50          Time Series

*******************************************************************************
*                          Resources                                          *
*******************************************************************************

                    Res       Ent
 Name       Units Stats  Search       Search      Path        Motion
 ---------- ----- ------- ---------- ----------- ----------- ----------
 provider_a1 1    By Unit Least Used Oldest      clinic_path Empty: 50 fpm
                                                 Home: off_a1 Full: 50 fpm
                                                 (Return)

 provider_a2 1    By Unit Closest    Oldest      clinic_path Empty: 50 fpm
                                                 Home: off_a2 Full: 50 fpm
                                                 (Return)

 provider_a3 1    By Unit Closest    Oldest      clinic_path Empty: 50 fpm
                                                 Home: off_a3 Full: 50 fpm
                                                 (Return)

 provider_b1 1    By Unit Closest    Oldest      clinic_path Empty: 50 fpm
                                                 Home: off_b1 Full: 50 fpm
                                                 (Return)

 provider_b2 1    By Unit Closest    Oldest      clinic_path Empty: 50 fpm
                                                 Home: off_b2 Full: 50 fpm
                                                 (Return)
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

provider_b3 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_b3 Full: 50 fpm
(Return)

provider_c1 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c1 Full: 50 fpm
(Return)

provider_c2 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c2 Full: 50 fpm
(Return)

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

****
* Clock downtimes for Resources *
****

Res	Frequency	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_a3	24hr	4hr	99	Yes	off_a3	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_b3	24hr	4hr	99	Yes	off_b3	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

****
* Work Searches *
****

Res	Node	Type	Location List
provider_a1	N25	Exclusive	exam_a1, exam_a2
provider_a2	N22	Exclusive	exam_a3, exam_a4
provider_a3	N22	Exclusive	exam_a5, exam_a6
provider_b1	N12	Exclusive	exam_b1, exam_b2
provider_b2	N16	Exclusive	exam_b3, exam_b6
provider_b3	N13	Exclusive	exam_b4, exam_b5
provider_c1	N5	Exclusive	exam_c1, exam_c3
provider_c2	N6	Exclusive	exam_c4, exam_c5
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4, exam_a5, exam_a6
nurse_b	N12	Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b4, exam_b5, exam_b6
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
*****************************************************************************
*                        Processing                                         *
*****************************************************************************

                    Process              Routing

Entity  Location  Operation          Blk Output  Destination Rule     Move Logic
------- --------- ----------------   --- ------- ---------- -------  ----------
patient entrance                     1  patient  recption_q FIRST 1   MOVE ON clinic_path

patient recption_q                   1  patient  reception  FIRST 1
patient reception  USE clerk FOR n(1.75,.5,1)

                                     1  patient  waiting_rm FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
              begin
              ROUTE 2
              end
            ELSE
              ROUTE 1

                      1  patient  screen_a   RANDOM 1  graphic 1
                                              MOVE WITH screener_a

                         patient  screen_b   RANDOM    graphic 1
                                              MOVE WITH screener_b

                         patient  screen_c   RANDOM    graphic 1
                                              MOVE WITH screener_c

                      2  patient  exam_a1    RANDOM 1  graphic 1
                                              MOVE WITH nurse_a
                         patient  exam_b1    RANDOM    graphic 1
                                              MOVE WITH nurse_b
                         patient  exam_c1    RANDOM    graphic 1
                                              MOVE WITH nurse_c
                         patient  exam_a2    RANDOM    graphic 1
                                              MOVE WITH nurse_a
                         patient  exam_b2    RANDOM    graphic 1
                                              MOVE WITH nurse_b
                         patient  exam_a3    RANDOM    graphic 1
                                              MOVE WITH nurse_a
                         patient  exam_b3    RANDOM    graphic 1
                                              MOVE WITH nurse_b
                         patient  exam_c3    RANDOM    graphic 1
                                              MOVE WITH nurse_c
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
                    patient exam_a4   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b4   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c4   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a5   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b5   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c5   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a6   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b6   RANDOM   graphic 1
                                      MOVE WITH nurse_b
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a

                1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a3 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a3
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
patient exam_a6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a3 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a3
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
patient exam_b4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
patient exam_c3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c1 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c1
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT     FIRST 1  MOVE ON clinic_path
```

```
*******************************************************************************
*                        Arrivals                                             *
*******************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ---------------- ---------- --------- --------- ----------
 patient  entrance p(79); arrival_cycle 0        5         24hr
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
*****************************************************************************
*                    Shift Assignments                                      *
*****************************************************************************

 Locations  Resources   Shift Files        Priorities   Disable Logic
 ---------  ---------  ----------------  ----------  ------  ----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_a3
        provider_b2
        provider_b3
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c


*****************************************************************************
*                         Attributes                                        *
*****************************************************************************

  ID        Type        Classification
  --------  ----------  --------------
 #
 #pt screened
  ascreened  Integer     Entity


*****************************************************************************
*                      Variables (global)                                   *
*****************************************************************************

  ID        Type        Initial value  Stats
  --------  ----------  -------------  ---------
  _min_var  Integer     0              None
  _hr_var   Integer     0              None
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-1 Status Quo Model

```
*****************************************************************************
*                        Subroutines                                        *
*****************************************************************************

 ID          Type        Parameter Type      Logic
 ----------- ----------- --------- ---------- ----------------
 _hr_24clock None                             PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var
                                              PROMPT "Enter the minutes when the simulation starts", _min_var
                                              INT x = 1
                                              WHILE x>0 DO
                                              BEGIN
                                                  WHILE _min_var < 60 DO
                                                  BEGIN
                                                      WAIT 1 MIN
                                                      INC _min_var
                                              END
                                                  INC _hr_var
                                                  _min_var=0
                                                  if _hr_var=24 then _hr_var=0
                                              END


*****************************************************************************
*                        Arrival Cycles                                     *
*****************************************************************************

 ID          Qty / %     Cumulative  Time (Hours) Value
 ----------- ----------- ----------- ----------- -----------
 arrival_cycle Percent    No          1          10
                          2           20
                          3           21.67
                          4           11.67
                          5           0
                          6           5.83
                          7           18.33
                          8           10.83
                          9           1.67
                          10 to 24    0
```

General Report
Output from C:\NEAL\GMP\GMPMEDMO\STAQUO.MOD [Family Practice Clinic]
Date: May/28/1997 Time: 11:35:42 AM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.27625 hr (Std. Dev. 0.4054666667 hr)

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.2762417	2	391	7.398194	0.459291	2	0.916667	22.96	(Average)
recption q	105.2762417	999999	391.083	0.259173	0.0160615	2.75	0.0833333	0.00	(Average)
waiting rm	105.2762417	64	780.167	1.966883	0.243049	5.41667	0	0.38	(Average)
exam a4	105.2762417	1	26	20.169371	0.082827	1	0	8.28	(Average)
exam a1	105.2762417	1	23.1667	19.741236	0.0727794	1	0	7.28	(Average)
exam a6	105.2762417	1	23.3333	28.429512	0.101623	1	0	10.16	(Average)
exam b1	105.2762417	1	24.0833	19.197472	0.0735254	1	0	7.35	(Average)
exam b3	105.2762417	1	23.1667	30.460680	0.104336	1	0	10.43	(Average)
exam b4	105.2762417	1	24.1667	23.150039	0.0865378	1	0	8.65	(Average)
exam c1	105.2762417	1	25.5833	19.834928	0.0801128	1	0	8.01	(Average)
exam c4	105.2762417	1	24.9167	22.379317	0.0904018	1	0	9.04	(Average)
exam c2	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc a2	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.2762417	1	126.583	5.560023	0.111386	1	0	11.14	(Average)
screen b	105.2762417	1	131.333	5.496880	0.1143	1	0	11.43	(Average)
screen a	105.2762417	1	132.167	5.455280	0.114101	1	0	11.41	(Average)
exam a2	105.2762417	1	25.9167	20.285620	0.0828931	1	0	8.29	(Average)
exam a3	105.2762417	1	24.5833	25.977398	0.0946999	1	0	9.47	(Average)
exam b2	105.2762417	1	25.25	20.864026	0.0833525	1	0	8.34	(Average)
exam b5	105.2762417	1	23.5	20.684871	0.0766313	1	0	7.66	(Average)
exam b6	105.2762417	1	24.3333	20.648693	0.0787696	1	0	7.88	(Average)
exam c3	105.2762417	1	24.6667	20.591018	0.0799167	1	0	7.99	(Average)
exam c5	105.2762417	1	22.8333	22.963768	0.082843	1	0	8.28	(Average)
exam c6	105.2762417	1	0	0.000000	0	0	0	0.00	(Average)

exam a5	105.2762417	1	24.5833	23.180486	0.08774	1	0	8.77 (Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.2762417	59.32	35.43	5.25	0.00	(Average)
recption q	105.2762417	98.46	1.54	0.00	0.00	(Average)
waiting rm	105.2762417	82.63	17.37	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.2762417	6.91	0.00	91.72	1.37	0.00	0.00	(Average)
exam a1	105.2762417	6.07	0.00	92.72	1.21	0.00	0.00	(Average)
exam a6	105.2762417	6.38	0.00	89.84	3.78	0.00	0.00	(Average)
exam b1	105.2762417	6.40	0.00	92.65	0.95	0.00	0.00	(Average)
exam b3	105.2762417	6.48	0.00	89.57	3.96	0.00	0.00	(Average)
exam b4	105.2762417	6.35	0.00	91.35	2.31	0.00	0.00	(Average)
exam c1	105.2762417	6.97	0.00	91.99	1.04	0.00	0.00	(Average)
exam c4	105.2762417	6.52	0.00	90.96	2.52	0.00	0.00	(Average)
exam c2	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a2	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.2762417	11.14	0.00	88.86	0.00	0.00	0.00	(Average)
screen b	105.2762417	11.43	0.00	88.57	0.00	0.00	0.00	(Average)
screen a	105.2762417	11.41	0.00	88.59	0.00	0.00	0.00	(Average)
exam a2	105.2762417	7.12	0.00	91.71	1.17	0.00	0.00	(Average)
exam a3	105.2762417	7.11	0.00	90.53	2.36	0.00	0.00	(Average)
exam b2	105.2762417	7.01	0.00	91.66	1.32	0.00	0.00	(Average)
exam b5	105.2762417	6.28	0.00	92.34	1.39	0.00	0.00	(Average)
exam b6	105.2762417	6.58	0.00	92.12	1.30	0.00	0.00	(Average)
exam c3	105.2762417	6.87	0.00	92.01	1.12	0.00	0.00	(Average)
exam c5	105.2762417	5.96	0.00	91.72	2.33	0.00	0.00	(Average)
exam c6	105.2762417	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam a5	105.2762417	6.36	0.00	91.23	2.41	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.6872125	49.0833	14.982349	0.326761	0.496154	0.00	30.73	(Average)
provider a2	1	38.14917083	50.5833	15.384458	0.367541	0.584515	0.00	34.76	(Average)
provider a3	1	38.00037361	47.9167	14.694497	0.330799	0.487929	0.00	31.56	(Average)
provider b1	1	40.68419306	49.3333	15.051599	0.343915	0.501548	0.00	31.09	(Average)
provider b2	1	38.10064444	47.5	15.539834	0.241396	0.486946	0.00	32.69	(Average)
provider b3	1	38.03466667	47.6667	14.673426	0.328089	0.514301	0.00	31.27	(Average)
provider c1	1	40.68229861	50.25	15.486966	0.224663	0.370668	0.00	32.24	(Average)
provider c2	1	37.97533194	47.75	14.494808	0.209853	0.346139	0.00	30.68	(Average)
screener a	1	37.98801111	132.167	6.231280	0.780622	1.848175	0.00	40.65	(Average)
screener b	1	37.99605278	131.333	6.172880	0.682140	1.492318	0.00	39.49	(Average)
screener c	1	37.99518056	126.583	6.310023	0.752248	1.284099	0.00	39.20	(Average)
nurse a.1	1	40.7138125	133.917	5.831318	0.640159	0.541491	0.00	35.49	(Average)
nurse a.2	1	40.7138125	95.25	11.755938	0.475851	0.623925	0.00	47.54	(Average)
nurse a.3	1	40.7138125	66	12.091587	0.451200	0.740578	0.00	33.64	(Average)
nurse a	3	122.1414375	295.167	9.107334	0.545210	0.613365	0.00	38.89	(Average)
nurse b.1	1	40.69188333	131.583	5.814673	0.392964	0.568731	0.00	33.36	(Average)
nurse b.2	1	40.69272361	95.5	11.152552	0.397801	0.622025	0.00	45.10	(Average)
nurse b.3	1	40.69188333	61.9167	12.265021	0.396568	0.734558	0.00	31.89	(Average)
nurse b	3	122.0764903	289	8.931376	0.395372	0.623838	0.00	36.78	(Average)
nurse c.1	1	40.67383333	98.4167	4.426013	0.508066	0.399531	0.00	19.83	(Average)
nurse c.2	1	40.69662222	66.5833	13.079507	0.328590	0.460530	0.00	36.25	(Average)
nurse c.3	1	40.67383333	31	13.564860	0.311872	0.599498	0.00	17.41	(Average)
nurse c	3	122.0442889	196	8.763257	0.416513	0.458976	0.00	24.50	(Average)
clerk.1	1	37.95297361	302.417	1.743160	0.009738	0.661319	0.00	23.27	(Average)
clerk.2	1	37.94691667	87.6667	1.741649	0.004112	0.718404	0.00	6.71	(Average)
clerk	2	75.89989028	390.083	1.742029	0.008477	0.692022	0.00	14.99	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.6872125	30.07	0.66	1.12	68.16	0.00	(Average)
provider a2	38.14917083	33.95	0.81	1.42	63.82	0.00	(Average)
provider a3	38.00037361	30.86	0.69	1.18	67.27	0.00	(Average)
provider b1	40.68419306	30.39	0.69	1.14	67.78	0.00	(Average)
provider b2	38.10064444	32.19	0.50	1.12	66.18	0.00	(Average)
provider b3	38.03466667	30.59	0.68	1.19	67.54	0.00	(Average)
provider c1	40.68229861	31.78	0.46	0.80	66.96	0.00	(Average)
provider c2	37.97533194	30.24	0.44	0.77	68.55	0.00	(Average)

screener a	37.98801111	36.12	4.53	1.46	57.89	0.00	(Average)
screener b	37.99605278	35.56	3.93	1.17	59.34	0.00	(Average)
screener c	37.99518056	35.03	4.18	1.05	59.75	0.00	(Average)
nurse a.1	40.7138125	31.98	3.50	2.80	61.72	0.00	(Average)
nurse a.2	40.7138125	45.68	1.86	2.39	50.07	0.00	(Average)
nurse a.3	40.7138125	32.41	1.23	1.97	64.39	0.00	(Average)
nurse a	122.1414375	36.69	2.20	2.39	58.73	0.00	(Average)
nurse b.1	40.69188333	31.24	2.12	2.92	63.72	0.00	(Average)
nurse b.2	40.69272361	43.54	1.56	2.37	52.53	0.00	(Average)
nurse b.3	40.69188333	30.89	1.00	1.94	66.17	0.00	(Average)
nurse b	122.0764903	35.22	1.56	2.41	60.81	0.00	(Average)
nurse c.1	40.67383333	17.78	2.05	1.84	78.33	0.00	(Average)
nurse c.2	40.69662222	35.35	0.90	1.54	62.22	0.00	(Average)
nurse c.3	40.67383333	17.01	0.40	1.17	81.42	0.00	(Average)
nurse c	122.0442889	23.38	1.11	1.52	73.99	0.00	(Average)
clerk.1	37.95297361	23.14	0.13	0.47	76.26	0.00	(Average)
clerk.2	37.94691667	6.70	0.02	0.58	92.70	0.00	(Average)
clerk	75.89989028	14.92	0.07	0.53	84.48	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	390.083	1	43.853361	8.222485	10.515409	24.520264	0.595203	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	18.86	23.54	56.23	1.37	(Average)

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
patient exam_b2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
patient exam_c3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c1 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c1
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT      FIRST 1  MOVE ON clinic_path

*******************************************************************************
*                        Arrivals                                             *
*******************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ---------------- ---------- --------- --------- ----------
 patient  entrance p(79); arrival_cycle 0       5         24hr
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
*****************************************************************************
*                        Shift Assignments                                  *
*****************************************************************************

 Locations  Resources   Shift Files        Priorities   Disable Logic
 ---------- ---------- ------------------ ------------ ------- ----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_b2
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c


*****************************************************************************
*                          Attributes                                       *
*****************************************************************************

 ID         Type       Classification
 ---------- ---------- --------------
#
#pt screened
 ascreened  Integer    Entity


*****************************************************************************
*                       Variables (global)                                  *
*****************************************************************************

 ID         Type       Initial value Stats
 ---------- ---------- ------------- ----------
 _min_var   Integer    0             None
 _hr_var    Integer    0             None
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
*****************************************************************************
*                        Subroutines                                        *
*****************************************************************************

 ID        Type       Parameter Type      Logic
 --------- ---------- --------- --------- ----------
 _hr_24clock None                         PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var
                                          PROMPT "Enter the minutes when the simulation starts", _min_var
                                          INT x = 1
                                          WHILE x>0 DO
                                          BEGIN
                                              WHILE _min_var < 60 DO
                                              BEGIN
                                                  WAIT 1 MIN
                                                  INC _min_var
                                          END
                                              INC _hr_var
                                              _min_var=0
                                              if _hr_var=24 then _hr_var=0
                                          END


*****************************************************************************
*                        Arrival Cycles                                     *
*****************************************************************************

 ID          Qty / %    Cumulative  Time (Hours) Value
 ----------- ---------- ----------- ---------- ----------
 arrival_cycle Percent     No        1          10
                           2         20
                           3         21.67
                           4         11.67
                           5         0
                           6         5.83
                           7         18.33
                           8         10.83
                           9         1.67
                           10 to 24  0
```

General Report
Output from C:\NEAL\GMP\GMPMEDMO\TDA.MOD [Family Practice Clinic]
Date: May/30/1997 Time: 09:18:22 PM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 104.9486167 hr Elapsed: 104.9486167 hr)
Simulation Time : 105.1600667 hr (Std. Dev. 0.43915 hr)

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.1600681	2	392.167	8.863693	0.552071	2	0.583333	27.60	(Average)
recption q	105.1600681	999999	392.167	0.248190	0.0154488	2.5	0	0.00	(Average)
waiting rm	105.1600681	64	783.083	1.814427	0.225412	5.16667	0.0833333	0.35	(Average)
exam a4	105.1600681	1	32.0833	20.838464	0.105643	1	0	10.56	(Average)
exam a1	105.1600681	1	33.75	21.389983	0.113722	1	0	11.37	(Average)
exam a6	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
exam b1	105.1600681	1	34.3333	21.747857	0.118815	1	0	11.88	(Average)
exam b3	105.1600681	1	32.6667	26.886787	0.141235	1	0	14.12	(Average)
exam b4	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
exam c1	105.1600681	1	33.0833	21.615010	0.113634	1	0	11.36	(Average)
exam c4	105.1600681	1	31.25	26.328175	0.130063	1	0.0833333	13.01	(Average)
exam c2	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc a2	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.1600681	1	129.583	5.523927	0.113426	1	0	11.34	(Average)
screen b	105.1600681	1	133.083	5.479057	0.115544	1	0	11.55	(Average)
screen a	105.1600681	1	128.833	5.500716	0.112326	1	0	11.23	(Average)
exam a2	105.1600681	1	33.75	21.947459	0.116704	1	0	11.67	(Average)
exam a3	105.1600681	1	32	24.929634	0.125604	1	0	12.56	(Average)
exam b2	105.1600681	1	32.1667	22.113377	0.111731	1	0	11.17	(Average)
exam b5	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)
exam b6	105.1600681	1	31.4167	24.803719	0.122953	1	0	12.30	(Average)
exam c3	105.1600681	1	33	20.711173	0.107738	1	0	10.77	(Average)
exam c5	105.1600681	1	32	24.477173	0.123258	1	0	12.33	(Average)
exam c6	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)

exam a5	105.1600681	1	0	0.000000	0	0	0	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.1600681	51.10	42.60	6.30	0.00	(Average)
recption q	105.1600681	98.51	1.49	0.00	0.00	(Average)
waiting rm	105.1600681	83.82	16.18	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.1600681	8.20	0.00	89.44	2.37	0.00	0.00	(Average)
exam a1	105.1600681	8.91	0.00	88.63	2.46	0.00	0.00	(Average)
exam a6	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam b1	105.1600681	9.48	0.00	88.12	2.40	0.00	0.00	(Average)
exam b3	105.1600681	9.31	0.00	85.88	4.82	0.00	0.00	(Average)
exam b4	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam c1	105.1600681	9.21	0.00	88.64	2.15	0.00	0.00	(Average)
exam c4	105.1600681	8.69	0.00	86.99	4.31	0.00	0.00	(Average)
exam c2	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a2	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.1600681	11.34	0.00	88.66	0.00	0.00	0.00	(Average)
screen b	105.1600681	11.55	0.00	88.45	0.00	0.00	0.00	(Average)
screen a	105.1600681	11.23	0.00	88.77	0.00	0.00	0.00	(Average)
exam a2	105.1600681	9.34	0.00	88.33	2.33	0.00	0.00	(Average)
exam a3	105.1600681	8.70	0.00	87.44	3.86	0.00	0.00	(Average)
exam b2	105.1600681	8.63	0.00	88.83	2.54	0.00	0.00	(Average)
exam b5	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam b6	105.1600681	8.56	0.00	87.70	3.73	0.00	0.00	(Average)
exam c3	105.1600681	8.99	0.00	89.23	1.78	0.00	0.00	(Average)
exam c5	105.1600681	8.84	0.00	87.67	3.49	0.00	0.00	(Average)
exam c6	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam a5	105.1600681	0.00	0.00	100.00	0.00	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.65291528	67.5	15.155554	0.327649	0.485130	0.00	42.61	(Average)
provider a2	1	38.04384722	64.0833	14.469426	0.342636	0.570444	0.00	41.55	(Average)
provider b1	1	40.6626125	66.5	15.151742	0.335836	0.488398	0.00	42.13	(Average)
provider b2	1	38.037525	64.0833	15.782262	0.243388	0.469581	0.00	44.84	(Average)
provider c1	1	40.64002222	66.0833	15.495548	0.222410	0.332050	0.00	42.30	(Average)
provider c2	1	38.11866528	63.1667	15.374887	0.212227	0.308327	0.00	43.03	(Average)
screener a	1	37.98175833	128.833	6.276716	0.778742	1.850660	0.00	39.89	(Average)
screener b	1	37.98015694	133.083	6.155057	0.682591	1.494762	0.00	39.93	(Average)
screener c	1	37.98520278	129.583	6.273927	0.753074	1.286026	0.00	39.95	(Average)
nurse a.1	1	40.67902778	120.417	5.888660	0.648510	0.500831	0.00	32.23	(Average)
nurse a.2	1	40.67585278	89.0833	11.055851	0.470023	0.577029	0.00	41.91	(Average)
nurse a.3	1	40.67585278	53.6667	12.540382	0.413706	0.708810	0.00	28.19	(Average)
nurse a	3	122.0307333	263.167	8.957362	0.540988	0.572633	0.00	34.11	(Average)
nurse b.1	1	40.67373194	122.25	5.512851	0.416980	0.580531	0.00	29.66	(Average)
nurse b.2	1	40.65469306	84.9167	11.893354	0.422831	0.633561	0.00	42.57	(Average)
nurse b.3	1	40.65469306	54	12.977679	0.419699	0.732529	0.00	29.35	(Average)
nurse b	3	121.9831181	261.167	9.082605	0.419470	0.632123	0.00	33.86	(Average)
nurse c.1	1	40.64499583	142.417	7.226651	0.391988	0.426159	0.00	44.42	(Average)
nurse c.2	1	40.65243472	116.167	11.306934	0.320275	0.457949	0.00	54.90	(Average)
nurse c	2	81.29743056	258.583	9.019932	0.359734	0.439834	0.00	49.66	(Average)
clerk.1	1	37.94556528	301.417	1.745468	0.012263	0.623897	0.00	23.27	(Average)
clerk.2	1	37.94235278	90.1667	1.741379	0.005460	0.712076	0.00	6.92	(Average)
clerk	2	75.88791806	391.583	1.744511	0.010680	0.671603	0.00	15.10	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.65291528	41.70	0.91	1.19	56.20	0.00	(Average)
provider a2	38.04384722	40.59	0.96	1.47	56.98	0.00	(Average)
provider b1	40.6626125	41.22	0.92	1.20	56.66	0.00	(Average)
provider b2	38.037525	44.16	0.68	1.16	54.00	0.00	(Average)
provider c1	40.64002222	41.70	0.60	0.96	56.74	0.00	(Average)
provider c2	38.11866528	42.45	0.59	0.92	56.05	0.00	(Average)
screener a	37.98175833	35.49	4.40	1.49	58.62	0.00	(Average)
screener b	37.98015694	35.94	3.99	1.16	58.91	0.00	(Average)
screener c	37.98520278	35.67	4.28	1.03	59.02	0.00	(Average)
nurse a.1	40.67902778	29.03	3.20	2.67	65.10	0.00	(Average)
nurse a.2	40.67585278	40.19	1.72	2.35	55.74	0.00	(Average)

nurse a.3	40.67585278	27.28	0.92	1.93	69.87	0.00	(Average)
nurse a	122.0307333	32.17	1.94	2.32	63.57	0.00	(Average)
nurse b.1	40.67373194	27.58	2.09	3.13	67.20	0.00	(Average)
nurse b.2	40.65469306	41.10	1.47	2.49	54.94	0.00	(Average)
nurse b.3	40.65469306	28.42	0.93	2.04	68.61	0.00	(Average)
nurse b	121.9831181	32.37	1.50	2.55	63.58	0.00	(Average)
nurse c.1	40.64499583	42.13	2.29	1.69	53.89	0.00	(Average)
nurse c.2	40.65243472	53.38	1.53	1.47	43.63	0.00	(Average)
nurse c	81.29743056	47.76	1.91	1.58	48.76	0.00	(Average)
clerk.1	37.94556528	23.11	0.16	0.43	76.29	0.00	(Average)
clerk.2	37.94235278	6.90	0.02	0.57	92.51	0.00	(Average)
clerk	75.88791806	15.00	0.09	0.50	84.40	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	391.417	0.75	45.990616	7.879024	12.886410	24.688322	0.536860	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	17.21	27.81	53.82	1.16	(Average)

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
*******************************************************************************
*                                                                             *
*              Formatted Listing of Model:                                    *
*              C:\NEAL\GMP\GMPMEDMO\ALT.MOD                                   *
*                                                                             *
*******************************************************************************

Time Units:              Minutes
Distance Units:          Feet
Initialization Logic:    ACTIVATE _hr_24clock ()

*******************************************************************************
*                          Locations                                          *
*******************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
**********************************************************************************
*                    Clock downtimes for Locations                    *
**********************************************************************************

 Loc       Frequency  First Time  Priority  Scheduled Disable Logic
 --------- ---------- ----------- --------- --------- ------- ----------------
 entrance  24hr       9hr         99        Yes       No      WAIT 10 HR


**********************************************************************************
*                          Entities                          *
**********************************************************************************

 Name      Speed (fpm)  Stats
 --------- ---------- ----------
 patient   50         Time Series


**********************************************************************************
*                          Resources                         *
**********************************************************************************

                    Res        Ent
 Name      Units Stats  Search      Search     Path       Motion
 --------- ----- ------- ----------- ---------- ---------- ----------
 provider_a1 1   By Unit Least Used  Oldest     clinic_path Empty: 50 fpm
                                                Home: off_a1 Full: 50 fpm
                                                (Return)

 provider_a2 1   By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_a2 Full: 50 fpm
                                                (Return)

 provider_b1 1   By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_b1 Full: 50 fpm
                                                (Return)

 provider_b2 1   By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_b2 Full: 50 fpm
                                                (Return)

 provider_c1 1   By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_c1 Full: 50 fpm
                                                (Return)
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

provider_c2 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c3 Full: 50 fpm
(Return)

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

****
* Clock downtimes for Resources *
****

Res	Freq	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

****
* Work Searches *
****

Res	Node	Type	Location List
provider_a1	N25	Exclusive	exam_a1, exam_a2, exam_a6
provider_a2	N22	Exclusive	exam_a3, exam_a4, exam_a5
provider_b1	N12	Exclusive	exam_b1, exam_b2, exam_b4
provider_b2	N16	Exclusive	exam_b3, exam_b6, exam_b5
provider_c1	N5	Exclusive	exam_c1, exam_c3, exam_c4
provider_c2	N6	Exclusive	exam_c5, exam_c2, exam_c6
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4
nurse_b	N12	Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b6
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
*****************************************************************************
*                          Processing                                       *
*****************************************************************************

                    Process              Routing

Entity  Location  Operation         Blk Output  Destination Rule     Move Logic
------- --------- ----------------  --- ------- ----------- -------- -----------
patient entrance                    1  patient  recption_q  FIRST 1   MOVE ON clinic_path

patient recption_q                  1  patient  reception   FIRST 1
patient reception  USE clerk FOR n(1.75,.5,1)
                                    1  patient  waiting_rm  FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
             IF ascreened=1 THEN
               begin
               ROUTE 2
               end
             ELSE
               ROUTE 1

                          1  patient  screen_a   RANDOM 1  graphic 1
                                                 MOVE WITH screener_a

                             patient  screen_b   RANDOM    graphic 1
                                                 MOVE WITH screener_b

                             patient  screen_c   RANDOM    graphic 1
                                                 MOVE WITH screener_c

                          2  patient  exam_a1    RANDOM 1  graphic 1
                                                 MOVE WITH nurse_a
                             patient  exam_b1    RANDOM    graphic 1
                                                 MOVE WITH nurse_b
                             patient  exam_c1    RANDOM    graphic 1
                                                 MOVE WITH nurse_c
                             patient  exam_a2    RANDOM    graphic 1
                                                 MOVE WITH nurse_a
                             patient  exam_b2    RANDOM    graphic 1
                                                 MOVE WITH nurse_b
                             patient  exam_c2    RANDOM    graphic 1
                                                 MOVE WITH nurse_c
                             patient  exam_a3    RANDOM    graphic 1
                                                 MOVE WITH nurse_a
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
                    patient exam_b3   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c3   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a4   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b4   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c4   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a5   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b5   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c5   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a6   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b6   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c6   RANDOM   graphic 1
                                      MOVE WITH nurse_c
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
patient exam_a1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a1 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a1
            graphic 1
            wait n(1,1,1)
            FREE nurse_a

                        1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_a2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a1 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a1
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a2 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a2
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a2 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a2
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient  departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
patient exam_b3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
patient exam_c1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c1 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c1
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c1 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c1
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c1 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c1
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT      FIRST 1  MOVE ON clinic_path


*******************************************************************************
*                        Arrivals                                             *
*******************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ---------------- ---------- ----------- ---------- ----------
 patient  entrance p(79); arrival_cycle 0        5         24hr
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
 patient  entrance p(79); arrival_cycle
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

```
**********************************************************************************
*                        Shift Assignments                                       *
**********************************************************************************

 Locations  Resources   Shift Files        Priorities   Disable Logic
 ---------  ---------  -----------------  ----------  ------  ----------------

        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_b2
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c


**********************************************************************************
*                        Attributes                                              *
**********************************************************************************

 ID        Type       Classification
 --------  ---------  ----------

#
#pt screened
 ascreened Integer    Entity


**********************************************************************************
*                        Variables (global)                                      *
**********************************************************************************

 ID        Type       Initial value Stats
 --------  ---------  ------------  ---------

 _min_var  Integer    0             None
 _hr_var   Integer    0             None
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-3 Alternate Model

****
* Subroutines *
****

ID	Type	Parameter	Type	Logic
_hr_24clock	None			PROMPT "Enter the hour when the simulation starts (24 hour clock)", _hr_var
				PROMPT "Enter the minutes when the simulation starts", _min_var
				INT x = 1
				WHILE x>0 DO
				BEGIN
				WHILE _min_var < 60 DO
				BEGIN
				WAIT 1 MIN
				INC _min_var
				END
				INC _hr_var
				_min_var=0
				if _hr_var=24 then _hr_var=0
				END

****
* Arrival Cycles *
****

ID	Qty / %	Cumulative	Time (Hours)	Value
arrival_cycle	Percent	No	1	10
		2	20	
		3	21.67	
		4	11.67	
		5	0	
		6	5.83	
		7	18.33	
		8	10.83	
		9	1.67	
		10 to 24	0	

General Report
Output from C:\NEAL\GMP\GMPMEDMO\ALT.MOD [Family Practice Clinic]
Date: May/30/1997 Time: 02:42:57 PM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 104.8245167 hr Elapsed: 104.8245167 hr)
Simulation Time : 105.1492 hr (Std. Dev. 0.3708 hr)

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.1491958	2	401.417	8.196770	0.52178	2	0.333333	26.09	(Average)
recption q	105.1491958	999999	401.417	0.246586	0.0156996	2.5	0	0.00	(Average)
waiting rm	105.1491958	64	802.083	1.545309	0.196572	5.33333	0.0833333	0.31	(Average)
exam a4	105.1491958	1	22.5	26.974717	0.0970885	1	0	9.71	(Average)
exam a1	105.1491958	1	22.3333	23.601778	0.0833058	1	0	8.33	(Average)
exam a6	105.1491958	1	21.3333	24.141885	0.0815535	1	0	8.16	(Average)
exam b1	105.1491958	1	23.1667	23.814686	0.0866306	1	0	8.66	(Average)
exam b3	105.1491958	1	21.75	22.915580	0.0788077	1	0	7.88	(Average)
exam b4	105.1491958	1	23.5	24.223639	0.0899468	1	0	8.99	(Average)
exam c1	105.1491958	1	23.8333	25.317455	0.0945026	1	0	9.45	(Average)
exam c4	105.1491958	1	22.9167	24.967333	0.090712	1	0	9.07	(Average)
exam c2	105.1491958	1	24	22.123117	0.084925	1	0	8.49	(Average)
doc a2	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.1491958	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.1491958	1	133.833	5.465121	0.115961	1	0	11.60	(Average)
screen b	105.1491958	1	133.5	5.490783	0.1162	1	0	11.62	(Average)
screen a	105.1491958	1	133.667	5.460767	0.115587	1	0	11.56	(Average)
exam a2	105.1491958	1	20.6667	23.573525	0.0759817	1	0	7.60	(Average)
exam a3	105.1491958	1	20.9167	24.212729	0.0803015	1	0	8.03	(Average)
exam b2	105.1491958	1	23.0833	24.557287	0.0893253	1	0	8.93	(Average)
exam b5	105.1491958	1	22.0833	25.962983	0.0922117	1	0	9.22	(Average)
exam b6	105.1491958	1	21.3333	28.774800	0.101945	1	0	10.19	(Average)
exam c3	105.1491958	1	21.75	24.174685	0.0826374	1	0	8.26	(Average)
exam c5	105.1491958	1	22.0833	22.775880	0.0793094	1	0	7.93	(Average)
exam c6	105.1491958	1	21.5	23.957451	0.0805384	1	0.0833333	8.05	(Average)

exam a5	105.1491958	1	22.25	25.574484	0.0895964	1	0	8.96	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.1491958	54.27	39.29	6.44	0.00	(Average)
recption q	105.1491958	98.48	1.52	0.00	0.00	(Average)
waiting rm	105.1491958	85.52	14.48	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.1491958	6.05	0.00	90.29	3.66	0.00	0.00	(Average)
exam a1	105.1491958	6.03	0.00	91.67	2.30	0.00	0.00	(Average)
exam a6	105.1491958	6.00	0.00	91.84	2.16	0.00	0.00	(Average)
exam b1	105.1491958	6.31	0.00	91.34	2.35	0.00	0.00	(Average)
exam b3	105.1491958	5.78	0.00	92.12	2.10	0.00	0.00	(Average)
exam b4	105.1491958	6.35	0.00	91.01	2.65	0.00	0.00	(Average)
exam c1	105.1491958	6.56	0.00	90.55	2.89	0.00	0.00	(Average)
exam c4	105.1491958	6.69	0.00	90.93	2.39	0.00	0.00	(Average)
exam c2	105.1491958	6.35	0.00	91.51	2.15	0.00	0.00	(Average)
doc a2	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.1491958	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.1491958	11.60	0.00	88.40	0.00	0.00	0.00	(Average)
screen b	105.1491958	11.62	0.00	88.38	0.00	0.00	0.00	(Average)
screen a	105.1491958	11.56	0.00	88.44	0.00	0.00	0.00	(Average)
exam a2	105.1491958	5.50	0.00	92.40	2.10	0.00	0.00	(Average)
exam a3	105.1491958	5.93	0.00	91.97	2.10	0.00	0.00	(Average)
exam b2	105.1491958	6.26	0.00	91.07	2.67	0.00	0.00	(Average)
exam b5	105.1491958	5.98	0.00	90.78	3.24	0.00	0.00	(Average)
exam b6	105.1491958	5.49	0.00	89.81	4.71	0.00	0.00	(Average)
exam c3	105.1491958	6.17	0.00	91.74	2.09	0.00	0.00	(Average)
exam c5	105.1491958	5.83	0.00	92.07	2.10	0.00	0.00	(Average)
exam c6	105.1491958	5.76	0.00	91.95	2.29	0.00	0.00	(Average)
exam a5	105.1491958	6.08	0.00	91.04	2.88	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.72871528	64.3333	15.308562	0.305465	0.480238	0.00	40.88	(Average)
provider a2	1	38.14862917	65.6667	15.385240	0.344975	0.548907	0.00	44.91	(Average)
provider b1	1	40.6751375	69.75	15.080767	0.336002	0.514727	0.00	43.94	(Average)
provider b2	1	38.11099722	65.1667	14.800342	0.281058	0.499352	0.00	42.92	(Average)
provider c1	1	40.68061944	68.5	15.889351	0.279929	0.391568	0.00	45.16	(Average)
provider c2	1	38.17906111	67.5	14.637052	0.282957	0.384111	0.00	43.92	(Average)
screener a	1	37.99811944	133.667	6.236767	0.779630	1.848561	0.00	41.11	(Average)
screener b	1	37.97681944	133.5	6.166783	0.681150	1.492942	0.00	40.12	(Average)
screener c	1	38.00023333	133.833	6.215121	0.753149	1.286518	0.00	40.91	(Average)
nurse a.1	1	40.75419861	120.917	6.271536	0.648659	0.535016	0.00	34.00	(Average)
nurse a.2	1	40.70565556	86	11.504724	0.485166	0.618360	0.00	42.06	(Average)
nurse a.3	1	40.7040875	53.0833	12.266170	0.475075	0.752412	0.00	27.50	(Average)
nurse a	3	122.1639417	260	9.196635	0.560011	0.610544	0.00	34.52	(Average)
nurse b.1	1	40.6833125	123.25	5.980359	0.414620	0.556177	0.00	32.24	(Average)
nurse b.2	1	40.6833125	91.5	10.791366	0.414118	0.595946	0.00	41.82	(Average)
nurse b.3	1	40.6833125	55.0833	12.032237	0.404500	0.725935	0.00	28.02	(Average)
nurse b	3	122.0499375	269.833	8.824894	0.412440	0.606820	0.00	34.03	(Average)
nurse c.1	1	40.69639444	125.417	5.814984	0.482092	0.398111	0.00	32.36	(Average)
nurse c.2	1	40.66758333	91.9167	11.347832	0.376458	0.439025	0.00	43.85	(Average)
nurse c.3	1	40.66958611	54.75	12.513309	0.354528	0.514600	0.00	28.73	(Average)
nurse c	3	122.0335639	272.083	8.996022	0.421148	0.437226	0.00	34.98	(Average)
clerk.1	1	37.95005833	309.583	1.740274	0.010799	0.663286	0.00	23.80	(Average)
clerk.2	1	37.94691667	91.5	1.750141	0.006526	0.709762	0.00	7.06	(Average)
clerk	2	75.896975	401.083	1.742125	0.009771	0.688285	0.00	15.43	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.72871528	40.07	0.80	1.10	58.02	0.00	(Average)
provider a2	38.14862917	43.92	0.99	1.37	53.72	0.00	(Average)
provider b1	40.6751375	42.98	0.96	1.22	54.84	0.00	(Average)
provider b2	38.11099722	42.12	0.80	1.22	55.86	0.00	(Average)
provider c1	40.68061944	44.38	0.78	0.89	53.94	0.00	(Average)
provider c2	38.17906111	43.09	0.83	1.01	55.06	0.00	(Average)
screener a	37.99811944	36.54	4.57	1.48	57.41	0.00	(Average)
screener b	37.97681944	36.13	3.99	1.18	58.69	0.00	(Average)
screener c	38.00023333	36.49	4.42	1.03	58.06	0.00	(Average)
nurse a.1	40.75419861	30.79	3.21	2.81	63.19	0.00	(Average)

nurse a.2	40.70565556	40.35	1.71	2.42	55.52	0.00	(Average)
nurse a.3	40.7040875	26.46	1.04	1.99	70.51	0.00	(Average)
nurse a	122.1639417	32.53	1.99	2.41	63.07	0.00	(Average)
nurse b.1	40.6833125	30.15	2.09	2.98	64.78	0.00	(Average)
nurse b.2	40.6833125	40.27	1.55	2.47	55.71	0.00	(Average)
nurse b.3	40.6833125	27.11	0.91	1.95	70.02	0.00	(Average)
nurse b	122.0499375	32.51	1.52	2.46	63.51	0.00	(Average)
nurse c.1	40.69639444	29.89	2.47	2.19	65.44	0.00	(Average)
nurse c.2	40.66758333	42.43	1.42	1.83	54.32	0.00	(Average)
nurse c.3	40.66958611	27.93	0.80	1.42	69.85	0.00	(Average)
nurse c	122.0335639	33.42	1.57	1.81	63.21	0.00	(Average)
clerk.1	37.95005833	23.65	0.15	0.45	75.75	0.00	(Average)
clerk.2	37.94691667	7.03	0.03	0.57	92.37	0.00	(Average)
clerk	75.896975	15.34	0.09	0.51	84.06	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	400.917	0.5	46.343612	7.442670	13.776926	24.604824	0.519192	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	16.10	29.47	53.30	1.13	(Average)

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
*******************************************************************************
*                                                                             *
*              Formatted Listing of Model:                                    *
*              C:\NEAL\GMP\GMPMEDMO\TDA.MOD                                   *
*                                                                             *
*******************************************************************************

Time Units:             Minutes
Distance Units:         Feet
Initialization Logic:    ACTIVATE _hr_24clock ()
```

Locations

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-2 TDA Model

```
*******************************************************************************
*                    Clock downtimes for Locations                            *
*******************************************************************************

 Loc       Frequency  First Time  Priority  Scheduled Disable Logic
 --------- ---------- ----------- --------- --------- ------- ----------------
 entrance  24hr       9hr         99        Yes       No      WAIT 10 HR


*******************************************************************************
*                          Entities                                           *
*******************************************************************************

 Name      Speed (fpm)  Stats
 --------- ----------- ----------
 patient   50          Time Series


*******************************************************************************
*                          Resources                                          *
*******************************************************************************

                    Res       Ent
 Name       Units   Stats     Search      Search      Path        Motion
 ---------- ------- --------- ----------- ----------- ----------- -----------
 provider_a1 1      By Unit   Least Used  Oldest      clinic_path Empty: 50 fpm
                                                                  Home: off_a1  Full: 50 fpm
                                                                  (Return)

 provider_a2 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                  Home: off_a2  Full: 50 fpm
                                                                  (Return)

 provider_b1 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                  Home: off_b1  Full: 50 fpm
                                                                  (Return)

 provider_b2 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                  Home: off_b2  Full: 50 fpm
                                                                  (Return)

 provider_c1 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                  Home: off_c1  Full: 50 fpm
                                                                  (Return)
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

provider_c2 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c2 Full: 50 fpm
(Return)

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

****
* Clock downtimes for Resources *
****

Res	Frequency	First Time	Priority	Scheduled	Node List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No WAIT 60 MIN

****
* Work Searches *
****

Res	Node	Type	Location List
provider_a1	N25	Exclusive	exam_a1, exam_a2
provider_a2	N22	Exclusive	exam_a3, exam_a4
provider_b1	N12	Exclusive	exam_b1, exam_b2
provider_b2	N16	Exclusive	exam_b3, exam_b6
provider_c1	N5	Exclusive	exam_c1, exam_c3
provider_c2	N6	Exclusive	exam_c4, exam_c5
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4
nurse_b	N12	Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b6
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals
B-2 TDA Model

```
*****************************************************************************
*                        Processing                                         *
*****************************************************************************

                    Process              Routing

Entity  Location  Operation         Blk Output  Destination Rule     Move Logic
------- --------- ----------------  --- ------- ----------- -------  ----------
patient entrance                    1  patient  recption_q  FIRST 1   MOVE ON clinic_path

patient recption_q                  1  patient  reception   FIRST 1
patient reception  USE clerk FOR n(1.75,.5,1)

                                    1  patient  waiting_rm  FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
              begin
              ROUTE 2
              end
             ELSE
              ROUTE 1

                                1  patient  screen_a   RANDOM 1  graphic 1
                                                       MOVE WITH screener_a

                                   patient  screen_b   RANDOM    graphic 1
                                                       MOVE WITH screener_b

                                   patient  screen_c   RANDOM    graphic 1
                                                       MOVE WITH screener_c

                                2  patient  exam_a1    RANDOM 1  graphic 1
                                                       MOVE WITH nurse_a
                                   patient  exam_b1    RANDOM    graphic 1
                                                       MOVE WITH nurse_b
                                   patient  exam_c1    RANDOM    graphic 1
                                                       MOVE WITH nurse_c
                                   patient  exam_a2    RANDOM    graphic 1
                                                       MOVE WITH nurse_a
                                   patient  exam_b2    RANDOM    graphic 1
                                                       MOVE WITH nurse_b
                                   patient  exam_a3    RANDOM    graphic 1
                                                       MOVE WITH nurse_a
                                   patient  exam_b3    RANDOM    graphic 1
                                                       MOVE WITH nurse_b
```

Annex B Text and Statistical Printouts of Models with 79 Patient Arrivals

B-2 TDA Model

```
                    patient exam_c3   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a4   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_c4   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_c5   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_b6   RANDOM   graphic 1
                                      MOVE WITH nurse_b
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a

                1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
*****************************************************************************
*                        Processing                                         *
*****************************************************************************

                    Process              Routing

Entity  Location  Operation          Blk Output  Destination Rule     Move Logic
------- --------- ----------------   --- ------- ---------- -------  ----------
patient entrance                     1  patient  recption_q FIRST 1   MOVE ON clinic_path

patient recption_q                   1  patient  reception  FIRST 1
patient reception USE clerk FOR n(1.75,.5,1)

                                     1  patient  waiting_rm FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
            begin
            ROUTE 2
            end
            ELSE
            ROUTE 1
                        1  patient  screen_a   RANDOM 1  graphic 1
                                                MOVE WITH screener_a

                           patient  screen_b   RANDOM    graphic 1
                                                MOVE WITH screener_b

                           patient  screen_c   RANDOM    graphic 1
                                                MOVE WITH screener_c

                        2  patient  exam_a1    RANDOM 1  graphic 1
                                                MOVE WITH nurse_a
                           patient  exam_b1    RANDOM    graphic 1
                                                MOVE WITH nurse_b
                           patient  exam_c1    RANDOM    graphic 1
                                                MOVE WITH nurse_c
                           patient  exam_a2    RANDOM    graphic 1
                                                MOVE WITH nurse_a
                           patient  exam_b2    RANDOM    graphic 1
                                                MOVE WITH nurse_b
                           patient  exam_a3    RANDOM    graphic 1
                                                MOVE WITH nurse_a
                           patient  exam_b3    RANDOM    graphic 1
                                                MOVE WITH nurse_b
                           patient  exam_c3    RANDOM    graphic 1
                                                MOVE WITH nurse_c
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

****

* Clock downtimes for Resources *

****

Res	Frequency	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_a3	24hr	4hr	99	Yes	off_a3	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_b3	24hr	4hr	99	Yes	off_b3	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

****

* Work Searches *

****

Res	Node	Type	Location List
provider_a1	N25	Exclusive	exam_a1, exam_a2
provider_a2	N22	Exclusive	exam_a3, exam_a4
provider_a3	N22	Exclusive	exam_a5, exam_a6
provider_b1	N12	Exclusive	exam_b1, exam_b2
provider_b2	N16	Exclusive	exam_b3, exam_b6
provider_b3	N13	Exclusive	exam_b4, exam_b5
provider_c1	N5	Exclusive	exam_c1, exam_c3
provider_c2	N6	Exclusive	exam_c4, exam_c5
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4, exam_a5, exam_a6
nurse_b	N12	Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b4, exam_b5, exam_b6
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
*******************************************************************************
*                                                                             *
*                  Formatted Listing of Model:                                *
*                  C:\NEAL\GMP\GMPMEDMO\SQ150A.MOD                            *
*                                                                             *
*******************************************************************************

Time Units:             Minutes
Distance Units:         Feet
Initialization Logic:   ACTIVATE _hr_24clock ()

*******************************************************************************
*                          Locations                                          *
*******************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
                    patient exam_a4   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b4   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c4   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a5   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b5   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c5   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a6   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b6   RANDOM   graphic 1
                                      MOVE WITH nurse_b
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a

                1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a3 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a3
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
patient exam_a6   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a3 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a3
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b2 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b2
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
patient exam_b4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-1 Status Quo Model

```
patient exam_c3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c       1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c       1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c       1  patient  departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1        1  patient EXIT      FIRST 1  MOVE ON clinic_path

*****************************************************************************
*                        Arrivals                                           *
*****************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ----------------- ---------- ----------- ---------- -----------
 patient  entrance p(150); arrival_cycle 0        5          24hr
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
```

of Models with 150 Patient Arrivals
del

****

routines *

****

neter Type Logic

---- ---------- ----------

```
PROMPT "Enter the hour when the simulation starts (24 hour clock)",

PROMPT "Enter the minutes when the simulation starts", _min_var
INT x = 1
WHILE x>0 DO
BEGIN
  WHILE _min_var < 60 DO
  BEGIN
    WAIT 1 MIN
    INC _min_var
  END
  INC _hr_var
  _min_var=0
  if _hr_var=24 then _hr_var=0
END
```

****

val Cycles *

****

****

mulative Time (Hours) Value

-------- ---------- ----------

****

No	1	10
2	20	
3	21.67	
4	11.67	
5	0	
6	5.83	
7	18.33	
8	10.83	
9	1.67	
10 to 24	0	

****

****

Annex C Text Printout of Models with 150 Patient Arrivals
C-2 TDA Model

```
*******************************************************************************
*                                                                             *
*                    Formatted Listing of Model:                              *
*                    C:\NEAL\GMP\GMPMEDMO\TDA150A.MOD                         *
*                                                                             *
*******************************************************************************

Time Units:             Minutes
Distance Units:         Feet
Initialization Logic:   ACTIVATE _hr_24clock ()

*******************************************************************************
*                          Locations                                          *
*******************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex C Text Printout of Models with 150 Patient Arrivals

C-2 TDA Model

```
patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT      FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-2 TDA Model

```
**********************************************************************************
*                Clock downtimes for Locations                                   *
**********************************************************************************

 Loc       Frequency   First Time  Priority    Scheduled Disable Logic
 --------- ----------- ---------- ---------- -------- ------ ----------------
 entrance  24hr        9hr        99          Yes      No     WAIT 10 HR


**********************************************************************************
*                          Entities                                              *
**********************************************************************************

 Name      Speed (fpm)  Stats
 --------- ----------- ---------
 patient   50          Time Series

**********************************************************************************
*                          Resources                                             *
**********************************************************************************

                    Res       Ent
 Name       Units   Stats     Search      Search      Path        Motion
 ---------- ------ -------- ----------- ----------- ----------- -----------
 provider_a1 1      By Unit   Least Used  Oldest      clinic_path Empty: 50 fpm
                                                                Home: off_a1  Full: 50 fpm
                                                                (Return)

 provider_a2 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                Home: off_a2  Full: 50 fpm
                                                                (Return)

 provider_b1 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                Home: off_b1  Full: 50 fpm
                                                                (Return)

 provider_b2 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                Home: off_b2  Full: 50 fpm
                                                                (Return)

 provider_c1 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                Home: off_c1  Full: 50 fpm
                                                                (Return)

 provider_c2 1      By Unit   Closest     Oldest      clinic_path Empty: 50 fpm
                                                                Home: off_c2  Full: 50 fpm
                                                                (Return)
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-2 TDA Model

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

****

* Clock downtimes for Resources *

****

Res	Freq	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

Annex C Text Printout of Models with 150 Patient Arrivals

C-2 TDA Model

```
*****************************************************************************
*                        Work Searches                                      *
*****************************************************************************

Res          Node     Type          Location List
-----------  -------- ------------  -----------
provider_a1  N25      Exclusive     exam_a1, exam_a2
provider_a2  N22      Exclusive     exam_a3, exam_a4
provider_b1  N12      Exclusive     exam_b1, exam_b2
provider_b2  N16      Exclusive     exam_b3, exam_b6
provider_c1  N5       Exclusive     exam_c1, exam_c3
provider_c2  N6       Exclusive     exam_c4, exam_c5
nurse_a      N21      Non-Exclusive exam_a1, exam_a2, exam_a3, exam_a4
nurse_b      N12      Non-Exclusive exam_b1, exam_b2, exam_b3, exam_b6
nurse_c      N7       Non-Exclusive exam_c1, exam_c3, exam_c4, exam_c5


*****************************************************************************
*                        Processing                                         *
*****************************************************************************

                     Process              Routing

Entity  Location  Operation          Blk Output  Destination Rule     Move Logic
------- --------- ----------------   --- ------- ----------- -------- ----------
patient entrance                     1  patient  recption_q  FIRST 1   MOVE ON clinic_path

patient recption_q                   1  patient  reception   FIRST 1
patient reception USE clerk FOR n(1.75,.5,1)

                                     1  patient  waiting_rm  FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
              begin
              ROUTE 2
              end
            ELSE
              ROUTE 1

                                     1  patient  screen_a    RANDOM 1  graphic 1
                                                              MOVE WITH screener_a

                                        patient  screen_b    RANDOM    graphic 1
                                                              MOVE WITH screener_b
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-2 TDA Model

```
                    patient screen_c   RANDOM   graphic 1
                                       MOVE WITH screener_c

                  2 patient exam_a1    RANDOM 1 graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b1    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c1    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a2    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b2    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_a3    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b3    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c3    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a4    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_c4    RANDOM   graphic 1
                                       MOVE WITH nurse_c

                    patient exam_c5    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_b6    RANDOM   graphic 1
                                       MOVE WITH nurse_b
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                      1  patient waiting_rm FIRST 1  graphic 1
                                            MOVE ON clinic_path

patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                            MOVE ON clinic_path
patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                            MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-2 TDA Model

```
patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a

                    1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-2 TDA Model

```
patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT      FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-2 TDA Model

```
*****************************************************************************
*                          Arrivals                                         *
*****************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ----------------- ---------- ----------- ---------- -----------
 patient  entrance p(150); arrival_cycle 0        5          24hr
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle


*****************************************************************************
*                       Shift Assignments                                   *
*****************************************************************************

 Locations  Resources  Shift Files       Priorities  Disable Logic
 ---------- ---------- ----------------- ----------- ------- ----------------
          clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
          provider_a2
          provider_b2
          provider_c2
          screener_a
          screener_b
          screener_c

          nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
          nurse_b
          provider_a1
          provider_b1
          provider_c1
          nurse_c
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-2 TDA Model

```
**********************************************************************************
*                          Attributes                                            *
**********************************************************************************

 ID        Type        Classification
 --------- ----------- --------------
#
#pt screened
 ascreened Integer     Entity

**********************************************************************************
*                       Variables (global)                                       *
**********************************************************************************

 ID        Type        Initial value Stats
 --------- ----------- ------------- ---------
 _min_var  Integer     0             None
 _hr_var   Integer     0             None


**********************************************************************************
*                          Subroutines                                           *
**********************************************************************************

 ID          Type      Parameter Type      Logic
 ----------- --------- --------- --------- ---------------
 _hr_24clock None                          PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var

                                          PROMPT "Enter the minutes when the simulation starts", _min_var
                                          INT x = 1
                                          WHILE x>0 DO
                                          BEGIN
                                              WHILE _min_var < 60 DO
                                              BEGIN
                                                  WAIT 1 MIN
                                                  INC _min_var
                                          END
                                              INC _hr_var
                                              _min_var=0
                                              if _hr_var=24 then _hr_var=0
                                          END
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-2 TDA Model

****
* Arrival Cycles *
****

ID	Qty / %	Cumulative	Time (Hours) Value	
arrival_cycle	Percent	No	1	10
		2	20	
		3	21.67	
		4	11.67	
		5	0	
		6	5.83	
		7	18.33	
		8	10.83	
		9	1.67	
		10 to 24	0	

Annex C Text Printout of Models with 150 Patient Arrivals
C-3 Alternate Model A

```
*******************************************************************************
*                                                                             *
*                    Formatted Listing of Model:                              *
*                    C:\NEAL\GMP\GMPMEDMO\ALT150A.MOD                         *
*                                                                             *
*******************************************************************************

Time Units:             Minutes
Distance Units:         Feet
Initialization Logic:   ACTIVATE _hr_24clock ()

*******************************************************************************
*                          Locations                                          *
*******************************************************************************

Name        Cap      Units      Stats        Rules
----------  -------  ---------  -----------  ----------------------
entrance    inf      1          None         Oldest, ,
departure   inf      1          None         Oldest, ,
reception   2        1          Time Series  Oldest, ,
recption_q  inf      1          Time Series  Oldest, ,
waiting_rm  64       1          Time Series  Oldest, ,
exam_a4     1        1          Time Series  Oldest, ,
exam_a1     1        1          Time Series  Oldest, ,
exam_a6     1        1          Time Series  Oldest, ,
exam_b1     1        1          Time Series  Oldest, ,
exam_b3     1        1          Time Series  Oldest, ,
exam_b4     1        1          Time Series  Oldest, ,
exam_c1     1        1          Time Series  Oldest, ,
exam_c4     1        1          Time Series  Oldest, ,
exam_c2     1        1          Time Series  Oldest, ,
screen_c    1        1          Time Series  Oldest, ,
screen_b    1        1          Time Series  Oldest, ,
screen_a    1        1          Time Series  Oldest, ,
exam_a2     1        1          Time Series  Oldest, ,
exam_a3     1        1          Time Series  Oldest, ,
exam_b2     1        1          Time Series  Oldest, ,
exam_b5     1        1          Time Series  Oldest, ,
exam_b6     1        1          Time Series  Oldest, ,
exam_c3     1        1          Time Series  Oldest, ,
exam_c5     1        1          Time Series  Oldest, ,
exam_c6     1        1          Time Series  Oldest, ,
exam_a5     1        1          Time Series  Oldest, ,
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
*****************************************************************************
*                Clock downtimes for Locations                              *
*****************************************************************************

 Loc       Frequency   First Time  Priority   Scheduled Disable Logic
 --------- ----------- ----------- ---------- --------- ------- ----------------
 entrance  24hr        9hr         99         Yes       No      WAIT 10 HR


*****************************************************************************
*                          Entities                                         *
*****************************************************************************

 Name      Speed (fpm)  Stats
 --------- ----------- ----------
 patient   50          Time Series


*****************************************************************************
*                          Resources                                        *
*****************************************************************************

                    Res       Ent
 Name       Units   Stats     Search     Search      Path        Motion
 ---------- ------ -------- ---------- ---------- ----------- ----------
 provider_a1 1      By Unit   Least Used Oldest      clinic_path Empty: 50 fpm
                                                               Home: off_a1 Full: 50 fpm
                                                               (Return)

 provider_a2 1      By Unit   Closest    Oldest      clinic_path Empty: 50 fpm
                                                               Home: off_a2 Full: 50 fpm
                                                               (Return)

 provider_b1 1      By Unit   Closest    Oldest      clinic_path Empty: 50 fpm
                                                               Home: off_b1 Full: 50 fpm
                                                               (Return)

 provider_b2 1      By Unit   Closest    Oldest      clinic_path Empty: 50 fpm
                                                               Home: off_b2 Full: 50 fpm
                                                               (Return)

 provider_c1 1      By Unit   Closest    Oldest      clinic_path Empty: 50 fpm
                                                               Home: off_c1 Full: 50 fpm
                                                               (Return)
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-3 Alternate Model A

provider_c2 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c3 Full: 50 fpm
(Return)

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 4 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 4 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

****

* Clock downtimes for Resources *

****

Res	Frequency	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

****

* Work Searches *

****

Res	Node	Type	Location List
provider_a1	N25	Exclusive	exam_a1, exam_a2, exam_a6
provider_a2	N22	Exclusive	exam_a3, exam_a4, exam_a5
provider_b1	N12	Exclusive	exam_b1, exam_b2, exam_b4
provider_b2	N16	Exclusive	exam_b3, exam_b6, exam_b5
provider_c1	N5	Exclusive	exam_c1, exam_c3, exam_c4
provider_c2	N6	Exclusive	exam_c5, exam_c2, exam_c6
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4
nurse_b	N12	Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b6
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
*****************************************************************************
*                        Processing                                         *
*****************************************************************************

                    Process              Routing

Entity  Location  Operation          Blk Output  Destination Rule     Move Logic
------- --------- ----------------   --- ------- ---------- -------- -----------
patient entrance                     1  patient  recption_q FIRST 1   MOVE ON clinic_path

patient recption_q                   1  patient  reception  FIRST 1
patient reception  USE clerk FOR n(1.75,.5,1)

                                     1  patient  waiting_rm FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
               begin
               ROUTE 2
               end
             ELSE
               ROUTE 1

                        1  patient  screen_a   RANDOM 1  graphic 1
                                                MOVE WITH screener_a

                           patient  screen_b   RANDOM    graphic 1
                                                MOVE WITH screener_b

                           patient  screen_c   RANDOM    graphic 1
                                                MOVE WITH screener_c

                        2  patient  exam_a1    RANDOM 1  graphic 1
                                                MOVE WITH nurse_a
                           patient  exam_b1    RANDOM    graphic 1
                                                MOVE WITH nurse_b
                           patient  exam_c1    RANDOM    graphic 1
                                                MOVE WITH nurse_c
                           patient  exam_a2    RANDOM    graphic 1
                                                MOVE WITH nurse_a
                           patient  exam_b2    RANDOM    graphic 1
                                                MOVE WITH nurse_b
                           patient  exam_c2    RANDOM    graphic 1
                                                MOVE WITH nurse_c
                           patient  exam_a3    RANDOM    graphic 1
                                                MOVE WITH nurse_a
                           patient  exam_b3    RANDOM    graphic 1
                                                MOVE WITH nurse_b
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
                    patient exam_c3   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a4   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b4   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c4   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a5   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b5   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c5   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a6   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b6   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c6   RANDOM   graphic 1
                                      MOVE WITH nurse_c

patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path


patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
                    1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a2  GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3  GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4  GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a5  GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a6  GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
```

```
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_b6  GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c1  GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c2  GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c3  GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c4  GRAPHIC 3
            wait n(1,1,1)
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient  exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

 patient  exam_c6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

 patient  departure  graphic 1        1  patient  EXIT      FIRST 1  MOVE ON clinic_path


 ********************************************************************************
 *                        Arrivals                                              *
 ********************************************************************************

  Entity   Location Qty each          First Time Occurrences Frequency  Logic
  -------  -------- ----------------- ---------- ---------- ---------  ----------
  patient  entrance p(150); arrival_cycle 0       5          24hr
  patient  entrance p(150); arrival_cycle
  patient  entrance p(150); arrival_cycle
  patient  entrance p(150); arrival_cycle
  patient  entrance p(150); arrival_cycle
  patient  entrance p(150); arrival_cycle
  patient  entrance p(150); arrival_cycle
  patient  entrance p(150); arrival_cycle
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
*******************************************************************************
*                        Shift Assignments                                    *
*******************************************************************************

 Locations  Resources   Shift Files        Priorities  Disable Logic
 ---------  ---------  ----------------  ----------  -------  ----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_b2
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c



*******************************************************************************
*                          Attributes                                         *
*******************************************************************************

 ID        Type       Classification
 ---------  ---------  ----------
#
#pt screened
 ascreened  Integer    Entity


*******************************************************************************
*                        Variables (global)                                   *
*******************************************************************************

 ID        Type       Initial value  Stats
 --------  ---------  -----------  ---------
 _min_var  Integer    0            None
 _hr_var   Integer    0            None
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-3 Alternate Model A

```
*******************************************************************************
*                          Subroutines                                        *
*******************************************************************************

 ID        Type        Parameter Type       Logic
 ---------- ---------- --------- ---------- ----------------
 _hr_24clock None                          PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var
                                           PROMPT "Enter the minutes when the simulation starts", _min_var
                                           INT x = 1
                                           WHILE x>0 DO
                                           BEGIN
                                             WHILE _min_var < 60 DO
                                              BEGIN
                                                      WAIT 1 MIN
                                                      INC _min_var
                                           END
                                             INC _hr_var
                                             _min_var=0
                                             if _hr_var=24 then _hr_var=0
                                           END


*******************************************************************************
*                          Arrival Cycles                                     *
*******************************************************************************

 ID          Qty / %     Cumulative  Time (Hours) Value
 ----------- ----------- ----------- ---------- ----------
 arrival_cycle Percent    No          1          10
                          2           20
                          3           21.67
                          4           11.67
                          5           0
                          6           5.83
                          7           18.33
                          8           10.83
                          9           1.67
                          10 to 24    0
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
*******************************************************************************
*                                                                             *
*                    Formatted Listing of Model:                              *
*                    C:\NEAL\GMP\GMPMEDMO\ALT150B.MOD                         *
*                                                                             *
*******************************************************************************

Time Units:             Minutes
Distance Units:         Feet
Initialization Logic:   ACTIVATE _hr_24clock ()

*******************************************************************************
*                          Locations                                          *
*******************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
*******************************************************************************
*                Clock downtimes for Locations                                *
*******************************************************************************

 Loc      Frequency  First Time  Priority   Scheduled Disable Logic
 -------- ---------- ---------- ---------- -------- ------ ---------------
 entrance 24hr       9hr        99         Yes      No     WAIT 10 HR

*******************************************************************************
*                          Entities                                           *
*******************************************************************************

 Name     Speed (fpm)  Stats
 -------- ---------- ---------
 patient  50         Time Series

*******************************************************************************
*                          Resources                                          *
*******************************************************************************

                    Res       Ent
 Name       Units Stats  Search      Search     Path       Motion
 ---------- ----- ------ ----------- ---------- ---------- ----------
 provider_a1 1    By Unit Least Used  Oldest     clinic_path Empty: 50 fpm
                                                Home: off_a1 Full: 50 fpm
                                                (Return)

 provider_a2 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_a2 Full: 50 fpm
                                                (Return)

 provider_b1 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_b1 Full: 50 fpm
                                                (Return)

 provider_b2 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_b2 Full: 50 fpm
                                                (Return)

 provider_c1 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_c1 Full: 50 fpm
                                                (Return)

 provider_c2 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                Home: off_c3 Full: 50 fpm
                                                (Return)
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 4 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 4 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 4 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

****
* Clock downtimes for Resources *
****

Res	Frequency	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
*****************************************************************************
*                          Work Searches                                    *
*****************************************************************************

Res          Node      Type          Location List
----------   --------  ----------    ----------
provider_a1  N25       Exclusive     exam_a1, exam_a2, exam_a6
provider_a2  N22       Exclusive     exam_a3, exam_a4, exam_a5
provider_b1  N12       Exclusive     exam_b1, exam_b2, exam_b4
provider_b2  N16       Exclusive     exam_b3, exam_b6, exam_b5
provider_c1  N5        Exclusive     exam_c1, exam_c3, exam_c4
provider_c2  N6        Exclusive     exam_c5, exam_c2, exam_c6
nurse_a      N21       Non-Excl      exam_a1, exam_a2, exam_a3, exam_a4, exam_a5, exam_a6
nurse_b      N12       Non-Excl      exam_b1, exam_b2, exam_b3, exam_b6, exam_b4, exam_b5
nurse_c      N7        Non-Excl      exam_c1, exam_c3, exam_c4, exam_c5, exam_c2, exam_c6


*****************************************************************************
*                          Processing                                       *
*****************************************************************************

                    Process          Routing

Entity  Location  Operation        Blk Output  Destination Rule     Move Logic
------- --------  ---------------  --- ------- ---------- -------  ----------
patient entrance                   1  patient  recption_q FIRST 1   MOVE ON clinic_path

patient recption_q                 1  patient  reception  FIRST 1
patient reception  USE clerk FOR n(1.75,.5,1)

                                   1  patient  waiting_rm FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
           IF ascreened=1 THEN
             begin
             ROUTE 2
             end
           ELSE
             ROUTE 1

                                   1  patient  screen_a   RANDOM 1  graphic 1
                                                          MOVE WITH screener_a

                                      patient  screen_b   RANDOM    graphic 1
                                                          MOVE WITH screener_b
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
                    patient screen_c   RANDOM   graphic 1
                                       MOVE WITH screener_c

                2   patient exam_a1    RANDOM 1  graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b1    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c1    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a2    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b2    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c2    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a3    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b3    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c3    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a4    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b4    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c4    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a5    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b5    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c5    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a6    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b6    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c6    RANDOM   graphic 1
                                       MOVE WITH nurse_c
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                1   patient waiting_rm FIRST 1  graphic 1
                                       MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                          MOVE ON clinic_path
patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                          MOVE ON clinic_path


patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a

                    1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a6   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
patient exam_b4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam
patient exam_b3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b2 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b2
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path


patient exam_b5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b2 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b2
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
patient exam_c4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c1 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c1
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c6   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_c
          JOINTLY GET provider_c2 AND nurse_c
          wait n(14.75,11,1)
          FREE provider_c2
          graphic 1
          wait n(1,1,1)
          FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT      FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

```
**********************************************************************************
*                          Arrivals                                *
**********************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ----------------- ---------- ---------- ---------- ----------
 patient  entrance p(150); arrival_cycle 0        5         24hr
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle

**********************************************************************************
*                       Shift Assignments                          *
**********************************************************************************

 Locations  Resources  Shift Files       Priorities  Disable Logic
 ---------- ---------- ----------------- ----------- ------- ----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_b2
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c


**********************************************************************************
*                          Attributes                              *
**********************************************************************************

  ID        Type       Classification
  --------- ---------- ----------
 #
 #pt screened
  ascreened Integer    Entity
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-4 Alternate Model B

****
* Variables (global) *
****

ID	Type	Initial value	Stats
_min_var	Integer	0	None
_hr_var	Integer	0	None

****
* Subroutines *
****

ID	Type	Parameter	Type	Logic
_hr_24clock	None			PROMPT "Enter the hour when the simulation starts (24 hour clock)", _hr_var
				PROMPT "Enter the minutes when the simulation starts", _min_var
				INT x = 1
				WHILE x>0 DO
				BEGIN
				WHILE _min_var < 60 DO
				BEGIN
				WAIT 1 MIN
				INC _min_var
				END
				INC _hr_var
				_min_var=0
				if _hr_var=24 then _hr_var=0
				END

****
* Arrival Cycles *
****

ID	Qty / %	Cumulative	Time (Hours)	Value
arrival_cycle	Percent	No	1	10
		2	20	
		3	21.67	
		4	11.67	
		5	0	
		6	5.83	
		7	18.33	
		8	10.83	
		9	1.67	
		10 to 24	0	

Annex C Text Printout of Models with 150 Patient Arrivals
C-5 Alternate Model C

```
*****************************************************************************
*                                                                           *
*                  Formatted Listing of Model:                              *
*                  C:\NEAL\GMP\GMPMEDMO\ALT150C.MOD                         *
*                                                                           *
*****************************************************************************
```

Time Units: Minutes
Distance Units: Feet
Initialization Logic: ACTIVATE _hr_24clock ()

Locations

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex C Text Printout of Models with 150 Patient Arrivals
C-5 Alternate Model C

```
                    patient screen_c   RANDOM   graphic 1
                                       MOVE WITH screener_c

                  2 patient exam_a1    RANDOM 1 graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b1    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c1    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a2    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b2    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c2    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a3    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b3    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c3    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a4    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b4    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c4    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a5    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b5    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c5    RANDOM   graphic 1
                                       MOVE WITH nurse_c
                    patient exam_a6    RANDOM   graphic 1
                                       MOVE WITH nurse_a
                    patient exam_b6    RANDOM   graphic 1
                                       MOVE WITH nurse_b
                    patient exam_c6    RANDOM   graphic 1
                                       MOVE WITH nurse_c
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                        1 patient waiting_rm FIRST 1  graphic 1
                                             MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-5 Alternate Model C

```
patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient  waiting_rm  FIRST 1  graphic 1
                                                    MOVE ON clinic_path
patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient  waiting_rm  FIRST 1  graphic 1
                                                    MOVE ON clinic_path
patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a
                        1  patient  departure  FIRST 1  MOVE ON clinic_path
patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a       1  patient  departure  FIRST 1  MOVE ON clinic_path
patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a       1  patient  departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-5 Alternate Model C

```
patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a6   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-5 Alternate Model C

```
patient exam_b2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b2 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b2
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b1 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b1
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_b
          JOINTLY GET provider_b2 AND nurse_b
          wait n(14.75,11,1)
          FREE provider_b2
          graphic 1
          wait n(1,1,1)
          FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-5 Alternate Model C

```
patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-5 Alternate Model C

```
patient exam_c4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c       1  patient  departure   FIRST 1   MOVE ON clinic_path

patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c       1  patient  departure   FIRST 1   MOVE ON clinic_path

patient exam_c6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c       1  patient  departure   FIRST 1   MOVE ON clinic_path

patient departure  graphic 1        1  patient  EXIT       FIRST 1   MOVE ON clinic_path

*****************************************************************************
*                        Arrivals                                           *
*****************************************************************************

 Entity   Location Qty each          First Time Occurrences Frequency  Logic
 -------  -------- ----------------- ---------- --------- ---------- -----------
 patient  entrance p(150); arrival_cycle 0       5         24hr
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-5 Alternate Model C

```
**********************************************************************************
*                    Shift Assignments                                           *
**********************************************************************************

 Locations  Resources   Shift Files        Priorities   Disable Logic
 ---------  ---------  -----------------  -----------  -------  ----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_b2
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c


**********************************************************************************
*                         Attributes                                             *
**********************************************************************************

 ID       Type       Classification
 ---------  ---------- ------------
#
#pt screened
-ascreened  Integer     Entity


**********************************************************************************
*                         Variables (global)                                     *
**********************************************************************************

 ID       Type       Initial value Stats
 --------  ---------- ------------ ----------
 _min_var  Integer    0            None
 _hr_var   Integer    0            None
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-5 Alternate Model C

```
*****************************************************************************
*                        Subroutines                                        *
*****************************************************************************

 ID        Type        Parameter  Type       Logic
 ----------- ----------- ---------- ---------- ----------------
 _hr_24clock None                        PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var
                                  PROMPT "Enter the minutes when the simulation starts", _min_var
                                  INT x = 1
                                  WHILE x>0 DO
                                  BEGIN
                                      WHILE _min_var < 60 DO
                                       BEGIN
                                           WAIT 1 MIN
                                           INC _min_var
                                  END
                                      INC _hr_var
                                      _min_var=0
                                      if _hr_var=24 then _hr_var=0
                                  END


*****************************************************************************
*                        Arrival Cycles                                     *
*****************************************************************************

 ID          Qty / %     Cumulative  Time (Hours) Value
 ------------ ----------- ----------- ----------- -----------
 arrival_cycle Percent     No          1          10
                           2           20
                           3           21.67
                           4           11.67
                           5           0
                           6           5.83
                           7           18.33
                           8           10.83
                           9           1.67
                           10 to 24    0
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
*******************************************************************************
*                                                                             *
*                    Formatted Listing of Model:                              *
*                    C:\NEAL\GMP\GMPMEDMO\ALT150D.MOD                         *
*                                                                             *
*******************************************************************************
```

Time Units:	Minutes
Distance Units:	Feet
Initialization Logic:	ACTIVATE _hr_24clock ()

```
*******************************************************************************
*                          Locations                                          *
*******************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
*****************************************************************************
*                  Clock downtimes for Locations                            *
*****************************************************************************

 Loc       Frequency   First Time  Priority    Scheduled Disable Logic
 --------- ----------- ----------- ----------- --------- ------- -----------------
 entrance  24hr        9hr         99          Yes       No      WAIT 10 HR


*****************************************************************************
*                          Entities                                         *
*****************************************************************************

 Name      Speed (fpm)  Stats
 --------- ----------- ----------
 patient   50          Time Series


*****************************************************************************
*                          Resources                                        *
*****************************************************************************

                    Res       Ent
 Name       Units Stats   Search      Search      Path        Motion
 ---------- ----- ------- ----------- ----------- ----------- ----------
 provider_a2 1    By Unit  Closest     Oldest      clinic_path  Empty: 50 fpm
                                                               Home: off_a2  Full: 50 fpm
                                                               (Return)

 provider_a3 1    By Unit  Closest     Oldest      clinic_path  Empty: 50 fpm
                                                               Home: off_a3  Full: 50 fpm
                                                               (Return)

 provider_b1 1    By Unit  Closest     Oldest      clinic_path  Empty: 50 fpm
                                                               Home: off_b1  Full: 50 fpm
                                                               (Return)

 provider_b2 1    By Unit  Closest     Oldest      clinic_path  Empty: 50 fpm
                                                               Home: off_b2  Full: 50 fpm
                                                               (Return)

 provider_b3 1    By Unit  Closest     Oldest      clinic_path  Empty: 50 fpm
                                                               Home: off_b3  Full: 50 fpm
                                                               (Return)
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

provider_c1 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c1 Full: 50 fpm
(Return)

provider_c2 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c3 Full: 50 fpm
(Return)

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 4 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

****
* Clock downtimes for Resources *
****

Res	Frequency	First Time	Priority	Scheduled	Node List	Disable Logic
provider_a2	24hr	4hr	99	Yes	off_a2	No WAIT 60 MIN
provider_a3	24hr	4hr	99	Yes	off_a3	No WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No WAIT 60 MIN
provider_b3	24hr	4hr	99	Yes	off_b3	No WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No WAIT 60 MIN

****
* Work Searches *
****

Res	Node	Type	Location List
provider_a2	N22	Exclusive	exam_a3, exam_a4, exam_a5
provider_a3	N22	Exclusive	exam_a1, exam_a2, exam_a6
provider_b1	N12	Exclusive	exam_b1, exam_b2
provider_b2	N16	Exclusive	exam_b3, exam_b6
provider_b3	N13	Exclusive	exam_b4, exam_b5
provider_c1	N5	Exclusive	exam_c1, exam_c3, exam_c4
provider_c2	N6	Exclusive	exam_c5, exam_c2, exam_c6
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4, exam_a5, exam_a6
nurse_b		Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b4, exam_b5,
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
*****************************************************************************
*                    Processing                                             *
*****************************************************************************

                    Process            Routing

Entity  Location  Operation        Blk Output  Destination Rule    Move Logic
------- --------- ---------------- --- ------- ----------- ------- ----------
patient entrance                   1  patient  recption_q  FIRST 1  MOVE ON clinic_path

patient recption_q                 1  patient  reception   FIRST 1
patient reception USE clerk FOR n(1.75,.5,1)

                                   1  patient  waiting_rm  FIRST 1  MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
              begin
              ROUTE 2
              end
             ELSE
              ROUTE 1

                          1  patient  screen_a   RANDOM 1  graphic 1
                                                 MOVE WITH screener_a

                             patient  screen_b   RANDOM    graphic 1
                                                 MOVE WITH screener_b

                             patient  screen_c   RANDOM    graphic 1
                                                 MOVE WITH screener_c

                          2  patient  exam_a1    RANDOM 1  graphic 1
                                                 MOVE WITH nurse_a
                             patient  exam_b1    RANDOM    graphic 1
                                                 MOVE WITH nurse_b
                             patient  exam_c1    RANDOM    graphic 1
                                                 MOVE WITH nurse_c
                             patient  exam_a2    RANDOM    graphic 1
                                                 MOVE WITH nurse_a
                             patient  exam_b2    RANDOM    graphic 1
                                                 MOVE WITH nurse_b
                             patient  exam_c2    RANDOM .  graphic 1
                                                 MOVE WITH nurse_c
                             patient  exam_a3    RANDOM    graphic 1
                                                 MOVE WITH nurse_a
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
                    patient exam_b3   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c3   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a4   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b4   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c4   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a5   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b5   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c5   RANDOM   graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a6   RANDOM   graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b6   RANDOM   graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c6   RANDOM   graphic 1
                                      MOVE WITH nurse_c
patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
patient exam_a1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a3 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a3
            graphic 1
            wait n(1,1,1)
            FREE nurse_a

                        1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a3 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a3
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a2 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a2
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a2 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a2
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
patient exam_a5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a2 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a2
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a3 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a3
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-6 Alternate Model D

```
patient exam_b3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-6 Alternate Model D

```
patient exam_c1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c1 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c1
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-6 Alternate Model D

```
patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient exam_c6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient  departure  FIRST 1  MOVE ON clinic_path

patient departure  graphic 1       1  patient  EXIT      FIRST 1  MOVE ON clinic_path
```

```
*******************************************************************************
*                        Arrivals                                             *
*******************************************************************************

 Entity   Location Qty each          First Time Occurrences Frequency  Logic
 -------- -------- ----------------- ---------- ---------- ---------- ----------
 patient  entrance p(150); arrival_cycle 0       5          24hr
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
 patient  entrance p(150); arrival_cycle
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
**********************************************************************************
*                    Shift Assignments                                           *
**********************************************************************************

 Locations  Resources  Shift Files        Priorities   Disable Logic
 ---------  ---------  ----------------   ----------   -------  ----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_a3
        provider_b2
        provider_b3
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_b1
        provider_c1
        nurse_c


**********************************************************************************
*                          Attributes                                            *
**********************************************************************************

  ID        Type        Classification
  --------- ----------- ----------
 #
 #pt screened
  ascreened Integer     Entity


**********************************************************************************
*                       Variables (global)                                       *
**********************************************************************************

  ID        Type        Initial value Stats
  --------- ----------- ------------- ---------
  _min_var  Integer     0             None
  _hr_var   Integer     0             None
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-6 Alternate Model D

```
*****************************************************************************
*                        Subroutines                                        *
*****************************************************************************

 ID        Type        Parameter  Type       Logic
 ---------- ----------- ---------- ---------- ----------------
 _hr_24clock None                             PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var
                                              PROMPT "Enter the minutes when the simulation starts", _min_var
                                              INT x = 1
                                              WHILE x>0 DO
                                              BEGIN
                                                  WHILE _min_var < 60 DO
                                                  BEGIN
                                                      WAIT 1 MIN
                                                      INC _min_var
                                                  END
                                                  INC _hr_var
                                                  _min_var=0
                                                  if _hr_var=24 then _hr_var=0
                                              END


*****************************************************************************
*                        Arrival Cycles                                     *
*****************************************************************************

 ID          Qty / %     Cumulative  Time (Hours) Value
 ----------- ----------- ----------- ----------- -----------
 arrival_cycle Percent    No          1          10
                          2           20
                          3           21.67
                          4           11.67
                          5           0
                          6           5.83
                          7           18.33
                          8           10.83
                          9           1.67
                          10 to 24    0
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
*****************************************************************************
*                                                                           *
*                    Formatted Listing of Model:                            *
*                    C:\NEAL\GMP\GMPMEDMO\ALT150E.MOD                       *
*                                                                           *
*****************************************************************************

Time Units:             Minutes
Distance Units:         Feet
Initialization Logic:   ACTIVATE _hr_24clock ()


*****************************************************************************
*                          Locations                                        *
*****************************************************************************
```

Name	Cap	Units	Stats	Rules
entrance	inf	1	None	Oldest, ,
departure	inf	1	None	Oldest, ,
reception	2	1	Time Series	Oldest, ,
recption_q	inf	1	Time Series	Oldest, ,
waiting_rm	64	1	Time Series	Oldest, ,
exam_a4	1	1	Time Series	Oldest, ,
exam_a1	1	1	Time Series	Oldest, ,
exam_a6	1	1	Time Series	Oldest, ,
exam_b1	1	1	Time Series	Oldest, ,
exam_b3	1	1	Time Series	Oldest, ,
exam_b4	1	1	Time Series	Oldest, ,
exam_c1	1	1	Time Series	Oldest, ,
exam_c4	1	1	Time Series	Oldest, ,
exam_c2	1	1	Time Series	Oldest, ,
screen_c	1	1	Time Series	Oldest, ,
screen_b	1	1	Time Series	Oldest, ,
screen_a	1	1	Time Series	Oldest, ,
exam_a2	1	1	Time Series	Oldest, ,
exam_a3	1	1	Time Series	Oldest, ,
exam_b2	1	1	Time Series	Oldest, ,
exam_b5	1	1	Time Series	Oldest, ,
exam_b6	1	1	Time Series	Oldest, ,
exam_c3	1	1	Time Series	Oldest, ,
exam_c5	1	1	Time Series	Oldest, ,
exam_c6	1	1	Time Series	Oldest, ,
exam_a5	1	1	Time Series	Oldest, ,

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
**********************************************************************************
*                  Clock downtimes for Locations                                 *
**********************************************************************************

 Loc       Frequency  First Time  Priority   Scheduled Disable Logic
 --------- ---------- ---------- ---------- -------- ------- -----------------
 entrance  24hr       9hr        99         Yes      No      WAIT 10 HR


**********************************************************************************
*                          Entities                                              *
**********************************************************************************

 Name      Speed (fpm)  Stats
 --------- ---------- ----------
 patient   50         Time Series


**********************************************************************************
*                          Resources                                             *
**********************************************************************************

                    Res       Ent
 Name       Units Stats  Search      Search     Path       Motion
 ---------- ----- ------- ----------- ---------- ---------- ----------
 provider_a1 1    By Unit Least Used  Oldest     clinic_path Empty: 50 fpm
                                                 Home: off_a1 Full: 50 fpm
                                                 (Return)

 provider_a2 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                 Home: off_a2 Full: 50 fpm
                                                 (Return)

 provider_a3 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                 Home: off_a3 Full: 50 fpm
                                                 (Return)

 provider_b1 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                 Home: off_b1 Full: 50 fpm
                                                 (Return)

 provider_b2 1    By Unit Closest     Oldest     clinic_path Empty: 50 fpm
                                                 Home: off_b2 Full: 50 fpm
                                                 (Return)
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

provider_b3 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_b3 Full: 50 fpm
(Return)

provider_c1 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c1 Full: 50 fpm
(Return)

provider_c2 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: off_c3 Full: 50 fpm
(Return)

screener_a 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_a Full: 50 fpm
(Return)

screener_b 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_b Full: 50 fpm
(Return)

screener_c 1 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: scr_c Full: 50 fpm
(Return)

nurse_a 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_a Full: 50 fpm
(Return)

nurse_b 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_b Full: 50 fpm
(Return)

nurse_c 3 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: nurse_c Full: 50 fpm
(Return)

clerk 2 By Unit Closest Oldest clinic_path Empty: 50 fpm
Home: clerks Full: 50 fpm
(Return)

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

****
* Clock downtimes for Resources *
****

Res	Frequency	First Time	Priority	Scheduled	Node	List	Disable Logic
provider_a1	24hr	4hr	99	Yes	off_a1	No	WAIT 60 MIN
provider_a2	24hr	4hr	99	Yes	off_a2	No	WAIT 60 MIN
provider_a3	24hr	4hr	99	Yes	off_a3	No	WAIT 60 MIN
provider_b1	24hr	4hr	99	Yes	off_b1	No	WAIT 60 MIN
provider_b2	24hr	4hr	99	Yes	off_b2	No	WAIT 60 MIN
provider_b3	24hr	4hr	99	Yes	off_b3	No	WAIT 60 MIN
provider_c1	24hr	4hr	99	Yes	off_c1	No	WAIT 60 MIN
provider_c2	24hr	4hr	99	Yes	off_c2	No	WAIT 60 MIN
screener_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
screener_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_a	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_b	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
nurse_c	24hr	4hr	99	Yes	dodge	No	WAIT 60 MIN
clerk	24hr	4hr	99	Yes	phone	No	WAIT 60 MIN

****
* Work Searches *
****

Res	Node	Type	Location List
provider_a1	N25	Exclusive	exam_a1, exam_a2
provider_a2	N22	Exclusive	exam_a3, exam_a4
provider_a3	N22	Exclusive	exam_a5, exam_a6
provider_b1	N12	Exclusive	exam_b1, exam_b2
provider_b2	N16	Exclusive	exam_b3, exam_b6
provider_b3	N13	Exclusive	exam_b4, exam_b5
provider_c1	N5	Exclusive	exam_c1, exam_c3, exam_c4
provider_c2	off_c3	Exclusive	exam_c5, exam_c2, exam_c6, doc_c3
nurse_a	N21	Non-Exclusive	exam_a1, exam_a2, exam_a3, exam_a4, exam_a5, exam_a6
nurse_b	N12	Non-Exclusive	exam_b1, exam_b2, exam_b3, exam_b4, exam_b5, exam_b6
nurse_c	N7	Non-Exclusive	exam_c1, exam_c3, exam_c4, exam_c5, exam_c2, exam_c6

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
*****************************************************************************
*                        Processing                                         *
*****************************************************************************

                    Process              Routing

Entity  Location  Operation         Blk Output  Destination Rule     Move Logic
------- --------- ----------------  --- ------- ----------- -------  ----------
patient entrance                    1  patient  recption_q  FIRST 1   MOVE ON clinic_path

patient recption_q                  1  patient  reception   FIRST 1
patient reception  USE clerk FOR n(1.75,.5,1)

                                 1  patient  waiting_rm  FIRST 1   MOVE FOR .2

patient waiting_rm GRAPHIC 2
            IF ascreened=1 THEN
              begin
              ROUTE 2
              end
             ELSE
              ROUTE 1

                              1  patient  screen_a   RANDOM 1  graphic 1
                                                     MOVE WITH screener_a

                                patient  screen_b   RANDOM    graphic 1
                                                     MOVE WITH screener_b

                                patient  screen_c   RANDOM    graphic 1
                                                     MOVE WITH screener_c

                              2  patient  exam_a1    RANDOM 1  graphic 1
                                                     MOVE WITH nurse_a
                                patient  exam_b1    RANDOM    graphic 1
                                                     MOVE WITH nurse_b
                                patient  exam_c1    RANDOM    graphic 1
                                                     MOVE WITH nurse_c
                                patient  exam_a2    RANDOM    graphic 1
                                                     MOVE WITH nurse_a
                                patient  exam_b2    RANDOM    graphic 1
                                                     MOVE WITH nurse_b
                                patient  exam_c2    RANDOM    graphic 1
                                                     MOVE WITH nurse_c
                                patient  exam_a3    RANDOM    graphic 1
                                                     MOVE WITH nurse_a
                                patient  exam_b3    RANDOM    graphic 1
                                                     MOVE WITH nurse_b
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
                    patient exam_c3   RANDOM  graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a4   RANDOM  graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b4   RANDOM  graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c4   RANDOM  graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a5   RANDOM  graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b5   RANDOM  graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c5   RANDOM  graphic 1
                                      MOVE WITH nurse_c
                    patient exam_a6   RANDOM  graphic 1
                                      MOVE WITH nurse_a
                    patient exam_b6   RANDOM  graphic 1
                                      MOVE WITH nurse_b
                    patient exam_c6   RANDOM  graphic 1
                                      MOVE WITH nurse_c

patient screen_a  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_a

                    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path


patient screen_b  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_b    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path

patient screen_c  GRAPHIC 2
          wait n(5.5,1.5,1)
          ascreened=1
          FREE screener_c    1  patient waiting_rm FIRST 1  graphic 1
                                      MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
patient exam_a1   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a

                    1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a2   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a1 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a1
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a3   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a4   GRAPHIC 3
          wait n(1,1,1)
          FREE nurse_a
          JOINTLY GET provider_a2 AND nurse_a
          wait n(14.75,11,1)
          FREE provider_a2
          graphic 1
          wait n(1,1,1)
          FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
patient exam_a5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a3 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a3
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_a6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_a
            JOINTLY GET provider_a3 AND nurse_a
            wait n(14.75,11,1)
            FREE provider_a3
            graphic 1
            wait n(1,1,1)
            FREE nurse_a      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b1   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b2   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b1 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b1
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-7 Alternate Model E

```
patient exam_b3   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b4   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b3 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b3
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_b6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_b
            JOINTLY GET provider_b2 AND nurse_b
            wait n(14.75,11,1)
            FREE provider_b2
            graphic 1
            wait n(1,1,1)
            FREE nurse_b      1  patient departure  FIRST 1  MOVE ON clinic_path
```

Annex C Text Printout of Models with 150 Patient Arrivals

C-7 Alternate Model E

```
patient exam_c5   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient exam_c6   GRAPHIC 3
            wait n(1,1,1)
            FREE nurse_c
            JOINTLY GET provider_c2 AND nurse_c
            wait n(14.75,11,1)
            FREE provider_c2
            graphic 1
            wait n(1,1,1)
            FREE nurse_c      1  patient departure  FIRST 1  MOVE ON clinic_path

patient departure graphic 1       1  patient EXIT      FIRST 1  MOVE ON clinic_path


*****************************************************************************
*                        Arrivals                                           *
*****************************************************************************

 Entity  Location Qty each          First Time Occurrences Frequency  Logic
 ------- -------- ----------------- ---------- ----------- ---------- ----------
 patient entrance p(150); arrival_cycle 0       5          24hr
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
 patient entrance p(150); arrival_cycle
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
*******************************************************************************
*                    Shift Assignments                                        *
*******************************************************************************

 Locations  Resources   Shift Files        Priorities   Disable Logic
 ---------  ----------  ------------------ -----------  -------  -----------------
        clerk      C:\NEAL\CLINIC.SFT  99,99,99,99  No
        provider_a2
        provider_a3
        provider_b2
        provider_b3
        provider_c2
        screener_a
        screener_b
        screener_c

        nurse_a    C:\NEAL\CLINIC2.SFT 99,99,99,99  No
        nurse_b
        provider_a1
        provider_b1
        provider_c1
        nurse_c


*******************************************************************************
*                         Attributes                                          *
*******************************************************************************

  ID        Type        Classification
  --------- ----------- -------------
#
#pt screened
  ascreened Integer     Entity


*******************************************************************************
*                    Variables (global)                                       *
*******************************************************************************

  ID        Type        Initial value Stats
  --------- ----------- ------------- ----------
  _min_var  Integer     0             None
  _hr_var   Integer     0             None
```

Annex C Text Printout of Models with 150 Patient Arrivals
C-7 Alternate Model E

```
*****************************************************************************
*                        Subroutines                                        *
*****************************************************************************

ID          Type        Parameter Type      Logic
----------- ----------- --------- --------- ---------------
_hr_24clock None                            PROMPT "Enter the hour when the simulation starts (24 hour clock)",
_hr_var
                                            PROMPT "Enter the minutes when the simulation starts", _min_var
                                            INT x = 1
                                            WHILE x>0 DO
                                            BEGIN
                                                WHILE _min_var < 60 DO
                                                BEGIN
                                                    WAIT 1 MIN
                                                    INC _min_var
                                            END
                                                INC _hr_var
                                                _min_var=0
                                                if _hr_var=24 then _hr_var=0
                                            END


*****************************************************************************
*                        Arrival Cycles                                     *
*****************************************************************************

ID          Qty / %     Cumulative  Time (Hours) Value
----------- ----------- ----------- ---------- ----------
arrival_cycle Percent   No          1          10
                        2           20
                        3           21.67
                        4           11.67
                        5           0
                        6           5.83
                        7           18.33
                        8           10.83
                        9           1.67
                        10 to 24    0
```

Annex D Statistical Printout of Models with 150 Patient Arrivals

Annex D Statistical Printout of Models with 150 Patient Arrivals

D-1 Status Quo Model

General Report
Output from C:\NEAL\GMP\GMPMEDMO\SQ150A.MOD [Family Practice Clinic]
Date: May/27/1997 Time: 07:40:35 AM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.5 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.5	2	736.917	8.759888	1.01481	2	1	50.74	(Average)
recption q	105.5	999999	737.083	0.591171	0.0675668	4.16667	0.166667	0.00	(Average)
waiting rm	105.5	64	1471.83	8.612418	2.01429	21.75	0	3.15	(Average)
exam a4	105.5	1	45.9167	29.331412	0.212824	1	0.0833333	21.28	(Average)
exam a1	105.5	1	45	24.528353	0.173411	1	0	17.34	(Average)
exam a6	105.5	1	44.4167	33.120517	0.233182	1	0.166667	23.32	(Average)
exam b1	105.5	1	45.8333	25.316686	0.183286	1	0	18.33	(Average)
exam b3	105.5	1	45.9167	29.959149	0.214457	1	0.0833333	21.45	(Average)
exam b4	105.5	1	45.5	25.782352	0.184948	1	0	18.49	(Average)
exam c1	105.5	1	48.25	25.694185	0.19575	1	0	19.57	(Average)
exam c4	105.5	1	47.5833	29.507710	0.222567	1	0.0833333	22.26	(Average)
exam c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.5	1	245	5.481990	0.212161	1	0	21.22	(Average)
screen b	105.5	1	248.5	5.468729	0.21466	1	0	21.47	(Average)
screen a	105.5	1	242.417	5.483693	0.209941	1	0	20.99	(Average)
exam a2	105.5	1	45.1667	25.649277	0.181976	1	0	18.20	(Average)
exam a3	105.5	1	45.5	28.706341	0.206797	1	0.0833333	20.68	(Average)
exam b2	105.5	1	46.5	24.399014	0.177988	1	0	17.80	(Average)
exam b5	105.5	1	46.1667	29.158468	0.212689	1	0.0833333	21.27	(Average)
exam b6	105.5	1	44.6667	27.600274	0.195098	1	0.0833333	19.51	(Average)
exam c3	105.5	1	48.5833	25.810388	0.19788	1	0	19.79	(Average)
exam c5	105.5	1	46.1667	30.105086	0.219472	1	0	21.95	(Average)
exam c6	105.5	1	0	0.000000	0	0	0	0.00	(Average)

exam a5	105.5	1	44.75	33.527436	0.236146	1	0.0833333	23.61	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.5	32.34	33.85	33.82	0.00	(Average)
recption q	105.5	93.85	6.15	0.00	0.00	(Average)
waiting rm	105.5	62.59	37.41	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.5	12.39	0.00	78.72	8.89	0.00	0.00	(Average)
exam a1	105.5	12.15	0.00	82.66	5.19	0.00	0.00	(Average)
exam a6	105.5	12.04	0.00	76.68	11.28	0.00	0.00	(Average)
exam b1	105.5	12.38	0.00	81.67	5.95	0.00	0.00	(Average)
exam b3	105.5	12.18	0.00	78.55	9.27	0.00	0.00	(Average)
exam b4	105.5	12.57	0.00	81.51	5.93	0.00	0.00	(Average)
exam c1	105.5	13.18	0.00	80.43	6.39	0.00	0.00	(Average)
exam c4	105.5	13.13	0.00	77.74	9.12	0.00	0.00	(Average)
exam c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.5	21.22	0.00	78.78	0.00	0.00	0.00	(Average)
screen b	105.5	21.47	0.00	78.53	0.00	0.00	0.00	(Average)
screen a	105.5	20.99	0.00	79.01	0.00	0.00	0.00	(Average)
exam a2	105.5	12.35	0.00	81.80	5.85	0.00	0.00	(Average)
exam a3	105.5	12.09	0.00	79.32	8.59	0.00	0.00	(Average)
exam b2	105.5	12.31	0.00	82.20	5.48	0.00	0.00	(Average)
exam b5	105.5	12.33	0.00	78.73	8.94	0.00	0.00	(Average)
exam b6	105.5	13.13	0.00	80.49	6.38	0.00	0.00	(Average)
exam c3	105.5	13.25	0.00	80.21	6.54	0.00	0.00	(Average)
exam c5	105.5	12.81	0.00	78.05	9.14	0.00	0.00	(Average)
exam c6	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam a5	105.5	12.68	0.00	76.39	10.94	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.79225	90.1667	15.147684	0.330863	0.443624	0.00	56.78	(Average)
provider a2	1	38.35774167	91.25	14.964318	0.377510	0.506690	0.00	60.63	(Average)
provider a3	1	38.26387361	88.9167	15.542562	0.329882	0.427021	0.00	61.42	(Average)
provider b1	1	40.80559167	92.3333	14.835341	0.343420	0.445908	0.00	57.11	(Average)
provider b2	1	38.22287917	90.4167	15.746853	0.240880	0.389668	0.00	62.77	(Average)
provider b3	1	38.23289167	91.5833	15.119122	0.336512	0.449595	0.00	61.65	(Average)
provider c1	1	40.76666667	96.8333	15.240131	0.229226	0.349291	0.00	61.24	(Average)
provider c2	1	38.09447917	93.6667	15.343518	0.208871	0.321720	0.00	63.72	(Average)
screener a	1	38.00484167	242.417	6.259693	0.786551	1.832025	0.00	74.89	(Average)
screener b	1	37.97969861	248.5	6.144729	0.687009	1.523430	0.00	74.49	(Average)
screener c	1	37.98293472	245	6.231990	0.760544	1.374270	0.00	75.17	(Average)
nurse a.1	1	40.82025	196.917	8.383884	0.617832	0.556572	0.00	72.27	(Average)
nurse a.2	1	40.82025	176.75	9.614957	0.582234	0.586689	0.00	73.42	(Average)
nurse a.3	1	40.82045417	167.417	9.730203	0.590402	0.635258	0.00	70.30	(Average)
nurse a	3	122.4609542	541.083	9.186038	0.598016	0.587940	0.00	72.00	(Average)
nurse b.1	1	40.8146	205.083	7.987761	0.428768	0.567408	0.00	70.23	(Average)
nurse b.2	1	40.79723889	177.917	9.655851	0.436146	0.612593	0.00	73.24	(Average)
nurse b.3	1	40.79716667	165.917	9.773155	0.434479	0.621259	0.00	68.73	(Average)
nurse b	3	122.4090056	548.917	9.037419	0.432917	0.596510	0.00	70.73	(Average)
nurse c.1	1	40.78515139	160.167	6.615223	0.451927	0.357331	0.00	46.26	(Average)
nurse c.2	1	40.77816667	124.667	10.156415	0.386501	0.383176	0.00	53.51	(Average)
nurse c.3	1	40.77816667	96.25	11.377599	0.364799	0.414738	0.00	46.18	(Average)
nurse c	3	122.3414847	381.083	8.956095	0.408882	0.380430	0.00	48.65	(Average)
clerk.1	1	37.95124306	487.583	1.739289	0.009617	0.613245	0.00	37.45	(Average)
clerk.2	1	37.94691667	248.333	1.743026	0.012359	0.649059	0.00	19.14	(Average)
clerk	2	75.89815972	735.917	1.740533	0.010537	0.632440	0.00	28.30	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.79225	55.56	1.22	1.68	41.55	0.00	(Average)
provider a2	38.35774167	59.13	1.50	2.05	37.32	0.00	(Average)
provider a3	38.26387361	60.15	1.28	1.69	36.89	0.00	(Average)
provider b1	40.80559167	55.81	1.29	1.72	41.17	0.00	(Average)
provider b2	38.22287917	61.82	0.95	1.52	35.71	0.00	(Average)
provider b3	38.23289167	60.31	1.34	1.81	36.54	0.00	(Average)
provider c1	40.76666667	60.33	0.91	0.96	37.80	0.00	(Average)
provider c2	38.09447917	62.87	0.86	0.91	35.37	0.00	(Average)

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked
patient	17.83	27.07	38.34	16.76 (Average)

General Report
Output from C:\NEAL\GMP\GMPMEDMO\TDA150A.MOD [Family Practice Clinic]
Date: May/28/1997 Time: 03:32:29 PM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.5 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.5	2	741.083	7.852804	0.921108	2	1.33333	46.06	(Average)
recption q	105.5	999999	741.417	0.491420	0.0579766	4.41667	0.333333	0.00	(Average)
waiting rm	105.5	64	1479.33	18.423080	4.36266	28.3333	1.08333	6.82	(Average)
exam a4	105.5	1	63.3333	53.890073	0.541739	1	0.416667	54.17	(Average)
exam a1	105.5	1	62.9167	33.201457	0.331252	1	0.25	33.13	(Average)
exam a6	105.5	1	0	0.000000	0	0	0	0.00	(Average)
exam b1	105.5	1	65.5833	35.721555	0.371474	1	0.0833333	37.15	(Average)
exam b3	105.5	1	62.5	57.866955	0.570744	1	0.25	57.07	(Average)
exam b4	105.5	1	0	0.000000	0	0	0	0.00	(Average)
exam c1	105.5	1	59.6667	34.768560	0.328001	1	0	32.80	(Average)
exam c4	105.5	1	55	58.481700	0.512018	1	0.583333	51.20	(Average)
exam c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.5	1	244.75	5.541631	0.214224	1	0	21.42	(Average)
screen b	105.5	1	251.083	5.502334	0.218203	1	0	21.82	(Average)
screen a	105.5	1	243.75	5.484353	0.211147	1	0	21.11	(Average)
exam a2	105.5	1	64.1667	37.751213	0.384516	1	0.0833333	38.45	(Average)
exam a3	105.5	1	63.75	53.349641	0.540317	1	0.416667	54.03	(Average)
exam b2	105.5	1	64	37.727254	0.382344	1	0.166667	38.23	(Average)
exam b5	105.5	1	0	0.000000	0	0	0	0.00	(Average)
exam b6	105.5	1	63.1667	53.432071	0.532969	1	0.666667	53.30	(Average)
exam c3	105.5	1	58.5833	32.686487	0.305164	1	0.25	30.52	(Average)
exam c5	105.5	1	56	57.081686	0.504665	1	0.5	50.47	(Average)
exam c6	105.5	1	0	0.000000	0	0	0	0.00	(Average)

exam a5	105.5	1	0	0.000000	0	0	0	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.5	34.62	38.64	26.74	0.00	(Average)
recption q	105.5	94.99	5.01	0.00	0.00	(Average)
waiting rm	105.5	50.06	49.94	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.5	16.80	0.00	45.83	37.37	0.00	0.00	(Average)
exam a1	105.5	17.39	0.00	66.87	15.74	0.00	0.00	(Average)
exam a6	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam b1	105.5	17.85	0.00	62.85	19.30	0.00	0.00	(Average)
exam b3	105.5	17.15	0.00	42.93	39.93	0.00	0.00	(Average)
exam b4	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam c1	105.5	16.26	0.00	67.20	16.54	0.00	0.00	(Average)
exam c4	105.5	15.07	0.00	48.80	36.13	0.00	0.00	(Average)
exam c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.5	21.42	0.00	78.58	0.00	0.00	0.00	(Average)
screen c	105.5	21.82	0.00	78.18	0.00	0.00	0.00	(Average)
screen b	105.5	21.11	0.00	78.89	0.00	0.00	0.00	(Average)
screen a	105.5	17.26	0.00	61.55	21.19	0.00	0.00	(Average)
exam a2	105.5	17.47	0.00	45.97	36.57	0.00	0.00	(Average)
exam a3	105.5	17.19	0.00	61.77	21.04	0.00	0.00	(Average)
exam b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam b5	105.5	17.20	0.00	46.70	36.10	0.00	0.00	(Average)
exam b6	105.5	15.00	0.00	69.48	15.52	0.00	0.00	(Average)
exam c3	105.5	15.64	0.00	49.53	34.83	0.00	0.00	(Average)
exam c5	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam c6	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
exam a5	105.5							

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	41.04375	126.75	15.323290	0.326227	0.497987	0.00	80.26	(Average)
provider a2	1	38.53972917	126.25	15.044660	0.328396	0.532478	0.00	83.72	(Average)
provider b1	1	41.08625972	129.333	15.046718	0.335852	0.488511	0.00	80.59	(Average)
provider b2	1	38.80935556	124.75	15.548828	0.267325	0.415593	0.00	84.57	(Average)
provider c1	1	41.14989861	118	14.746394	0.221967	0.292441	0.00	71.43	(Average)
provider c2	1	38.38552639	109.917	15.625313	0.224033	0.260298	0.00	75.49	(Average)
screener a	1	38.01200139	243.75	6.260353	0.786749	1.830040	0.00	75.30	(Average)
screener b	1	38.02234444	251.083	6.178334	0.688484	1.524075	0.00	75.56	(Average)
screener c	1	37.99592639	244.75	6.291631	0.760925	1.374919	0.00	75.70	(Average)
nurse a.1	1	40.96924167	184.75	8.400449	0.603011	0.478877	0.00	67.46	(Average)
nurse a.2	1	40.93268194	163.583	9.577049	0.583093	0.520246	0.00	67.61	(Average)
nurse a.3	1	40.84273333	158.833	9.558948	0.587561	0.529445	0.00	65.57	(Average)
nurse a	3	122.7446569	507.167	9.132131	0.592060	0.507461	0.00	66.88	(Average)
nurse b.1	1	41.04375833	188	8.221525	0.492445	0.567453	0.00	66.36	(Average)
nurse b.2	1	40.85650417	165.917	9.480299	0.505017	0.577396	0.00	67.41	(Average)
nurse b.3	1	40.83450278	155.417	9.527332	0.510537	0.601873	0.00	63.57	(Average)
nurse b	3	122.7347653	509.333	9.010585	0.502080	0.580701	0.00	65.78	(Average)
nurse c.1	1	40.98885833	233.25	8.625634	0.393987	0.486527	0.00	85.46	(Average)
nurse c.2	1	41.00618194	223.917	9.093051	0.382807	0.515639	0.00	86.12	(Average)
nurse c	2	81.99504028	457.167	8.850419	0.388525	0.500415	0.00	85.79	(Average)
clerk.1	1	37.95682083	490.5	1.739768	0.009119	0.627193	0.00	37.66	(Average)
clerk.2	1	37.94971389	249.25	1.745717	0.009253	0.671781	0.00	19.21	(Average)
clerk	2	75.90653472	739.75	1.741508	0.009198	0.651403	0.00	28.44	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	41.04375	78.58	1.68	1.30	18.44	0.00	(Average)
provider a2	38.53972917	81.93	1.79	1.52	14.76	0.00	(Average)
provider b1	41.08625972	78.83	1.76	1.35	18.05	0.00	(Average)
provider b2	38.80935556	83.14	1.43	1.05	14.37	0.00	(Average)
provider c1	41.14989861	70.37	1.06	1.43	27.14	0.00	(Average)
provider c2	38.38552639	74.43	1.07	1.26	23.25	0.00	(Average)
screener a	38.01200139	66.89	8.41	1.20	23.50	0.00	(Average)
screener b	38.02234444	67.99	7.58	0.98	23.46	0.00	(Average)
screener c	37.99592639	67.53	8.17	0.90	23.40	0.00	(Average)
nurse a.1	40.96924167	62.92	4.53	2.40	30.14	0.00	(Average)
nurse a.2	40.93268194	63.73	3.88	2.28	30.11	0.00	(Average)

nurse a.3	40.84273333	61.75	3.81	2.17	32.26	0.00	(Average)
nurse a	122.7446569	62.80	4.08	2.29	30.84	0.00	(Average)
nurse b.1	41.04375833	62.60	3.76	2.89	30.75	0.00	(Average)
nurse b.2	40.85650417	63.99	3.42	2.59	30.00	0.00	(Average)
nurse b.3	40.83450278	60.33	3.24	2.49	33.94	0.00	(Average)
nurse b	122.7347653	62.31	3.47	2.66	31.56	0.00	(Average)
nurse c.1	40.98885833	81.72	3.74	1.20	13.34	0.00	(Average)
nurse c.2	41.00618194	82.63	3.49	1.18	12.70	0.00	(Average)
nurse c	81.99504028	82.18	3.61	1.19	13.02	0.00	(Average)
clerk.1	37.95682083	37.47	0.20	0.40	61.93	0.00	(Average)
clerk.2	37.94971389	19.11	0.10	0.50	80.29	0.00	(Average)
clerk	75.90653472	28.29	0.15	0.45	71.11	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	735	6.41667	100.391421	13.940382	33.911241	24.703454	27.836343	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	14.06	33.39	25.93	26.62	(Average)

Annex D Statistical Printout of Models with 150 Patient Arrivals

D-3 Alternate Model A

General Report
Output from C:\NEAL\GMP\GMPMEDMO\ALT150A.MOD [Family Practice Clinic]
Date: May/28/1997 Time: 08:28:14 PM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.5 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.5	2	750.333	7.808626	0.924434	2	1.33333	46.22	(Average)
recption q	105.5	999999	750.583	0.986854	0.115922	4.16667	0.25	0.00	(Average)
waiting rm	105.5	64	1498	9.177264	2.18555	22.5833	0.666667	3.41	(Average)
exam a4	105.5	1	41	62.165580	0.403344	1	0.25	40.33	(Average)
exam a1	105.5	1	40.6667	40.712675	0.261607	1	0.0833333	26.16	(Average)
exam a6	105.5	1	39.4167	42.315272	0.262561	1	0	26.26	(Average)
exam b1	105.5	1	41.25	39.675390	0.258187	1	0	25.82	(Average)
exam b3	105.5	1	41.3333	53.210074	0.349369	1	0.166667	34.94	(Average)
exam b4	105.5	1	41.3333	44.473097	0.290053	1	0.0833333	29.01	(Average)
exam c1	105.5	1	42.9167	42.611210	0.287493	1	0.0833333	28.75	(Average)
exam c4	105.5	1	42.5833	43.851214	0.294912	1	0	29.49	(Average)
exam c2	105.5	1	41	60.393919	0.393834	1	0.166667	39.38	(Average)
doc a2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.5	1	248.333	5.495629	0.215587	1	0	21.56	(Average)
screen b	105.5	1	254.583	5.476555	0.220263	1	0	22.03	(Average)
screen a	105.5	1	246.083	5.483213	0.213186	1	0	21.32	(Average)
exam a2	105.5	1	40.4167	42.319429	0.27016	1	0.0833333	27.02	(Average)
exam a3	105.5	1	41	55.721859	0.355338	1	0.25	35.53	(Average)
exam b2	105.5	1	43.4167	41.193046	0.282354	1	0.166667	28.24	(Average)
exam b5	105.5	1	43.4167	60.102176	0.408969	1	0.25	40.90	(Average)
exam b6	105.5	1	41.6667	56.283946	0.36846	1	0.416667	36.85	(Average)
exam c3	105.5	1	43.0833	41.136927	0.279383	1	0.0833333	27.94	(Average)
exam c5	105.5	1	41.6667	54.179789	0.357525	1	0.25	35.75	(Average)
exam c6	105.5	1	41.25	51.190807	0.332059	1	0.333333	33.21	(Average)

exam a5	105.5	1	40.9167	53.700328	0.346623	1	0.25	34.66	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.5	36.85	33.85	29.29	0.00	(Average)
recption q	105.5	89.04	10.96	0.00	0.00	(Average)
waiting rm	105.5	62.22	37.78	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.5	11.21	0.00	59.67	29.12	0.00	0.00	(Average)
exam a1	105.5	11.12	0.00	73.84	15.04	0.00	0.00	(Average)
exam a6	105.5	11.02	0.00	73.74	15.24	0.00	0.00	(Average)
exam b1	105.5	11.10	0.00	74.18	14.71	0.00	0.00	(Average)
exam b3	105.5	11.06	0.00	65.06	23.88	0.00	0.00	(Average)
exam b4	105.5	11.28	0.00	70.99	17.72	0.00	0.00	(Average)
exam c1	105.5	11.99	0.00	71.25	16.76	0.00	0.00	(Average)
exam c4	105.5	11.17	0.00	70.51	18.32	0.00	0.00	(Average)
exam c2	105.5	11.33	0.00	60.62	28.06	0.00	0.00	(Average)
doc a2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.5	21.56	0.00	78.44	0.00	0.00	0.00	(Average)
screen b	105.5	22.03	0.00	77.97	0.00	0.00	0.00	(Average)
screen a	105.5	21.32	0.00	78.68	0.00	0.00	0.00	(Average)
exam a2	105.5	11.61	0.00	72.98	15.40	0.00	0.00	(Average)
exam a3	105.5	10.89	0.00	64.47	24.65	0.00	0.00	(Average)
exam b2	105.5	11.90	0.00	71.76	16.34	0.00	0.00	(Average)
exam b5	105.5	11.57	0.00	59.10	29.32	0.00	0.00	(Average)
exam b6	105.5	11.10	0.00	63.15	25.75	0.00	0.00	(Average)
exam c3	105.5	11.71	0.00	72.06	16.23	0.00	0.00	(Average)
exam c5	105.5	11.47	0.00	64.25	24.29	0.00	0.00	(Average)
exam c6	105.5	11.01	0.00	66.79	22.20	0.00	0.00	(Average)
exam a5	105.5	11.13	0.00	65.34	23.53	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.92058333	120.333	15.748714	0.298574	0.471353	0.00	78.55	(Average)
provider a2	1	38.59502917	122.167	15.127925	0.366607	0.488043	0.00	81.43	(Average)
provider b1	1	40.92469722	125.75	15.196904	0.303769	0.583201	0.00	79.25	(Average)
provider b2	1	38.61927361	125.583	15.062255	0.307205	0.530200	0.00	83.12	(Average)
provider c1	1	40.96342222	128.417	15.064246	0.298572	0.444106	0.00	80.18	(Average)
provider c2	1	38.2940375	123.167	15.293005	0.301612	0.397135	0.00	83.55	(Average)
screener a	1	38.0006	246.083	6.259213	0.788003	1.828031	0.00	76.07	(Average)
screener b	1	38.01151667	254.583	6.152555	0.687684	1.525115	0.00	76.36	(Average)
screener c	1	38.02597222	248.333	6.245629	0.761921	1.395663	0.00	76.27	(Average)
nurse a.1	1	40.89057222	176.667	8.612511	0.614211	0.498115	0.00	66.25	(Average)
nurse a.2	1	40.89376944	166.667	9.367831	0.601253	0.508993	0.00	67.49	(Average)
nurse a.3	1	40.82550417	142.583	10.061458	0.584371	0.529466	0.00	61.67	(Average)
nurse a	3	122.6098458	485.917	9.265876	0.601233	0.510298	0.00	65.14	(Average)
nurse b.1	1	40.91002639	164.333	8.129948	0.432852	0.520927	0.00	57.07	(Average)
nurse b.2	1	40.85172917	140.167	9.568421	0.432446	0.540894	0.00	56.89	(Average)
nurse b.3	1	40.79959722	112.333	10.157710	0.439998	0.570908	0.00	48.43	(Average)
nurse b.4	1	40.79716667	86.9167	8.029964	0.456173	0.607613	0.00	29.69	(Average)
nurse b	4	163.3585194	503.75	8.910089	0.438583	0.552521	0.00	48.03	(Average)
nurse c.1	1	40.93039028	162.25	8.411829	0.450804	0.371967	0.00	58.36	(Average)
nurse c.2	1	40.84954167	141.333	9.581188	0.424784	0.382657	0.00	57.49	(Average)
nurse c.3	1	40.77899861	116.917	9.774192	0.416555	0.405977	0.00	48.54	(Average)
nurse c.4	1	40.77816667	83.5833	8.036032	0.459947	0.445045	0.00	28.73	(Average)
nurse c	4	163.3370972	504.083	8.952425	0.437524	0.395330	0.00	48.29	(Average)
clerk.1	1	37.95039444	497.5	1.755429	0.008418	0.619797	0.00	38.54	(Average)
clerk.2	1	37.94691667	251.5	1.742353	0.010208	0.661071	0.00	19.36	(Average)
clerk	2	75.89731111	749	1.751123	0.009013	0.641095	0.00	28.95	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.92058333	77.09	1.46	1.30	20.15	0.00	(Average)
provider a2	38.59502917	79.50	1.93	1.49	17.09	0.00	(Average)
provider b1	40.92469722	77.69	1.56	1.10	19.65	0.00	(Average)
provider b2	38.61927361	81.46	1.67	1.01	15.87	0.00	(Average)
provider c1	40.96342222	78.62	1.56	0.81	19.02	0.00	(Average)
provider c2	38.2940375	81.94	1.62	0.72	15.72	0.00	(Average)
screener a	38.0006	67.56	8.50	1.15	22.78	0.00	(Average)
screener b	38.01151667	68.68	7.68	1.00	22.64	0.00	(Average)

screener c	38.02597222	67.98	8.29	0.89	22.84	0.00	(Average)
nurse a.1	40.89057222	61.83	4.42	2.89	30.86	0.00	(Average)
nurse a.2	40.89376944	63.40	4.09	2.73	29.78	0.00	(Average)
nurse a.3	40.82550417	58.26	3.41	2.44	35.90	0.00	(Average)
nurse a	122.6098458	61.16	3.97	2.68	32.18	0.00	(Average)
nurse b.1	40.91002639	54.17	2.90	3.59	39.34	0.00	(Average)
nurse b.2	40.85172917	54.42	2.47	3.26	39.85	0.00	(Average)
nurse b.3	40.79959722	46.41	2.02	2.77	48.79	0.00	(Average)
nurse b.4	40.79716667	28.07	1.62	2.36	67.95	0.00	(Average)
nurse b	163.3585194	45.78	2.25	2.99	48.97	0.00	(Average)
nurse c.1	40.93039028	55.38	2.98	2.53	39.11	0.00	(Average)
nurse c.2	40.84954167	55.04	2.45	2.30	40.20	0.00	(Average)
nurse c.3	40.77899861	46.55	1.99	2.06	49.40	0.00	(Average)
nurse c.4	40.77816667	27.15	1.58	1.70	69.57	0.00	(Average)
nurse c	163.3370972	46.04	2.25	2.15	49.56	0.00	(Average)
clerk.1	37.95039444	38.35	0.18	0.42	61.05	0.00	(Average)
clerk.2	37.94691667	19.25	0.11	0.49	80.15	0.00	(Average)
clerk	75.89731111	28.80	0.15	0.45	70.60	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	745.417	5.16667	86.263852	9.887295	37.654549	24.743746	13.978261	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	11.53	43.41	29.05	16.02	(Average)

Annex D Statistical Printout of Models with 150 Patient Arrivals

D-4 Alternate Model B

General Report
Output from C:\NEAL\GMP\GMPMEDMO\ALT150B.MOD [Family Practice Clinic]
Date: May/28/1997 Time: 01:41:44 PM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.4342167 hr (Std. Dev. 0.2278833333 hr)

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.4342181	2	729.917	7.151471	0.822822	2	1.25	41.14	(Average)
recption q	105.4342181	999999	730.083	0.879921	0.102504	4.25	0.166667	0.00	(Average)
waiting rm	105.4342181	64	1457.17	8.348765	1.93931	22.1667	0.166667	3.03	(Average)
exam a4	105.4342181	1	40.5833	52.958593	0.340191	1	0.25	34.02	(Average)
exam a1	105.4342181	1	40.6667	38.901116	0.249758	1	0	24.98	(Average)
exam a6	105.4342181	1	39.3333	40.044728	0.249556	1	0	24.96	(Average)
exam b1	105.4342181	1	41.9167	41.854428	0.278436	1	0	27.84	(Average)
exam b3	105.4342181	1	40.25	57.381410	0.367373	1	0.25	36.74	(Average)
exam b4	105.4342181	1	39	40.530011	0.249022	1	0.166667	24.90	(Average)
exam c1	105.4342181	1	42.5833	37.835626	0.254506	1	0.0833333	25.45	(Average)
exam c4	105.4342181	1	41.8333	39.966840	0.267055	1	0	26.71	(Average)
exam c2	105.4342181	1	40.3333	47.599347	0.303932	1	0.416667	30.39	(Average)
doc a2	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.4342181	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.4342181	1	241.333	5.530127	0.210895	1	0	21.09	(Average)
screen b	105.4342181	1	245.917	5.440768	0.211458	1	0	21.15	(Average)
screen a	105.4342181	1	241.25	5.518698	0.210496	1	0	21.05	(Average)
exam a2	105.4342181	1	39.8333	37.163063	0.234673	1	0.0833333	23.47	(Average)
exam a3	105.4342181	1	40.25	55.850855	0.359466	1	0.25	35.95	(Average)
exam b2	105.4342181	1	41.1667	39.596617	0.258513	1	0	25.85	(Average)
exam b5	105.4342181	1	40.5	57.328731	0.367853	1	0.333333	36.79	(Average)
exam b6	105.4342181	1	42.0833	52.033875	0.348844	1	0.416667	34.88	(Average)
exam c3	105.4342181	1	39.6667	39.272059	0.248643	1	0.0833333	24.86	(Average)
exam c5	105.4342181	1	40.0833	53.243066	0.338611	1	0.416667	33.86	(Average)
exam c6	105.4342181	1	39.1667	53.949581	0.334609	1	0.166667	33.46	(Average)

exam a5	105.4342181	1	39.25	48.502900	0.299352	1	0.333333	29.94	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.4342181	39.69	38.35	21.97	0.00	(Average)
recption q	105.4342181	91.57	8.43	0.00	0.00	(Average)
waiting rm	105.4342181	59.57	40.43	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.4342181	10.55	0.00	65.98	23.47	0.00	0.00	(Average)
exam a1	105.4342181	11.18	0.00	75.02	13.80	0.00	0.00	(Average)
exam a6	105.4342181	10.47	0.00	75.04	14.48	0.00	0.00	(Average)
exam b1	105.4342181	11.85	0.00	72.16	15.99	0.00	0.00	(Average)
exam b3	105.4342181	11.14	0.00	63.26	25.60	0.00	0.00	(Average)
exam b4	105.4342181	10.68	0.00	75.10	14.22	0.00	0.00	(Average)
exam c1	105.4342181	11.35	0.00	74.55	14.10	0.00	0.00	(Average)
exam c4	105.4342181	11.32	0.00	73.29	15.38	0.00	0.00	(Average)
exam c2	105.4342181	10.63	0.00	69.61	19.76	0.00	0.00	(Average)
doc a2	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.4342181	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.4342181	21.09	0.00	78.91	0.00	0.00	0.00	(Average)
screen b	105.4342181	21.15	0.00	78.85	0.00	0.00	0.00	(Average)
screen a	105.4342181	21.05	0.00	78.95	0.00	0.00	0.00	(Average)
exam a2	105.4342181	10.58	0.00	76.53	12.89	0.00	0.00	(Average)
exam a3	105.4342181	11.50	0.00	64.05	24.44	0.00	0.00	(Average)
exam b2	105.4342181	10.91	0.00	74.15	14.94	0.00	0.00	(Average)
exam b5	105.4342181	10.73	0.00	63.21	26.06	0.00	0.00	(Average)
exam b6	105.4342181	11.00	0.00	65.12	23.88	0.00	0.00	(Average)
exam c3	105.4342181	10.79	0.00	75.14	14.08	0.00	0.00	(Average)
exam c5	105.4342181	10.46	0.00	66.14	23.40	0.00	0.00	(Average)
exam c6	105.4342181	11.11	0.00	66.54	22.35	0.00	0.00	(Average)
exam a5	105.4342181	10.82	0.00	70.06	19.12	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.89193056	119.75	15.071862	0.294297	0.547061	0.00	74.93	(Average)
provider a2	1	38.45207639	119.25	15.326039	0.358615	0.605079	0.00	80.98	(Average)
provider b1	1	40.90920694	121.917	15.282386	0.306101	0.566076	0.00	77.27	(Average)
provider b2	1	38.4227125	121.833	15.088700	0.312308	0.519672	0.00	81.33	(Average)
provider c1	1	40.93592917	123.917	14.938584	0.298417	0.446124	0.00	76.93	(Average)
provider c2	1	38.35606806	118.583	15.095506	0.298355	0.392473	0.00	79.05	(Average)
screener a	1	38.03675694	241.25	6.294698	0.785825	1.833133	0.00	74.86	(Average)
screener b	1	38.0360625	245.917	6.116768	0.687343	1.516952	0.00	73.31	(Average)
screener c	1	38.00805833	241.333	6.280127	0.760394	1.364664	0.00	74.48	(Average)
nurse a.1	1	40.85185556	157.417	8.219238	0.598892	0.483077	0.00	56.51	(Average)
nurse a.2	1	40.86805417	136.667	9.408554	0.564249	0.516579	0.00	55.23	(Average)
nurse a.3	1	40.81549722	107.583	10.477699	0.545036	0.552147	0.00	48.26	(Average)
nurse a.4	1	40.793575	77.25	8.968546	0.595426	0.622933	0.00	29.77	(Average)
nurse a	4	163.3289819	478.917	9.135758	0.577706	0.530992	0.00	47.45	(Average)
nurse b.1	1	40.85221389	161.833	8.283363	0.426816	0.528448	0.00	57.30	(Average)
nurse b.2	1	40.80504861	137.083	9.488681	0.434366	0.547066	0.00	55.27	(Average)
nurse b.3	1	40.81664861	112.667	9.885269	0.436604	0.567032	0.00	47.25	(Average)
nurse b.4	1	40.77087639	77.0833	8.325847	0.437929	0.632476	0.00	27.34	(Average)
nurse b	4	163.2447875	488.667	8.951234	0.433136	0.559314	0.00	46.80	(Average)
nurse c.1	1	40.84932778	160.917	8.192941	0.447060	0.374664	0.00	56.48	(Average)
nurse c.2	1	40.87317639	140	9.207339	0.431626	0.383664	0.00	54.85	(Average)
nurse c.3	1	40.76244861	111.167	10.030992	0.412563	0.408988	0.00	47.13	(Average)
nurse c.4	1	40.75219306	74.0833	8.458406	0.448445	0.461438	0.00	26.30	(Average)
nurse c	4	163.2371458	486.167	8.873913	0.435784	0.398426	0.00	46.20	(Average)
clerk.1	1	37.95501528	482.583	1.756453	0.007675	0.630749	0.00	37.39	(Average)
clerk.2	1	37.9476125	246.083	1.753726	0.008913	0.684304	0.00	19.04	(Average)
clerk	2	75.90262778	728.667	1.755289	0.008065	0.658839	0.00	28.21	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.89193056	73.50	1.44	1.02	24.05	0.00	(Average)
provider a2	38.45207639	79.13	1.85	1.11	17.91	0.00	(Average)
provider b1	40.90920694	75.75	1.52	1.11	21.63	0.00	(Average)
provider b2	38.4227125	79.68	1.65	0.95	17.72	0.00	(Average)
provider c1	40.93592917	75.42	1.51	0.83	22.24	0.00	(Average)
provider c2	38.35606806	77.51	1.54	0.79	20.16	0.00	(Average)
screener a	38.03675694	66.55	8.31	1.23	23.91	0.00	(Average)

screener b	38.0360625	65.90	7.41	1.00	25.69	0.00	(Average)
screener c	38.00805833	66.44	8.05	0.91	24.61	0.00	(Average)
nurse a.1	40.85185556	52.66	8.85	3.20	40.29	0.00	(Average)
nurse a.2	40.86805417	52.08	3.15	3.00	41.77	0.00	(Average)
nurse a.3	40.81549722	45.86	2.40	2.57	49.17	0.00	(Average)
nurse a.4	40.793575	27.88	1.89	2.18	68.04	0.00	(Average)
nurse a	163.3289819	44.62	2.82	2.74	49.81	0.00	(Average)
nurse b.1	40.85221389	54.48	2.82	3.65	39.05	0.00	(Average)
nurse b.2	40.80504861	52.84	2.43	3.25	41.48	0.00	(Average)
nurse b.3	40.81664861	45.23	2.01	2.79	49.97	0.00	(Average)
nurse b.4	40.77087639	25.96	1.38	2.30	70.36	0.00	(Average)
nurse b	163.2447875	44.63	2.16	2.99	50.21	0.00	(Average)
nurse c.1	40.84932778	53.54	2.94	2.56	40.96	0.00	(Average)
nurse c.2	40.87317639	52.39	2.46	2.31	42.84	0.00	(Average)
nurse c.3	40.76244861	45.25	1.88	2.02	50.85	0.00	(Average)
nurse c.4	40.75219306	24.93	1.37	1.59	72.11	0.00	(Average)
nurse c	163.2371458	44.04	2.16	2.12	51.68	0.00	(Average)
clerk.1	37.95501528	37.22	0.16	0.44	62.18	0.00	(Average)
clerk.2	37.9476125	18.94	0.09	0.51	80.46	0.00	(Average)
clerk	75.90262778	28.08	0.13	0.47	71.32	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	725.25	4.83333	81.224156	9.586924	34.381796	24.654095	12.601342	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	11.94	42.22	30.61	15.23	(Average)

Annex D Statistical Printout of Models with 150 Patient Arrivals

D-5 Alternate Model C

General Report
Output from C:\NEAL\GMP\GMPMEDMO\ALT150C.MOD [Family Practice Clinic]
Date: May/29/1997 Time: 02:55:19 PM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.5 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.5	2	744.5	7.837463	0.920756	2	1.16667	46.04	(Average)
recption q	105.5	999999	744.667	0.679195	0.0789093	3.91667	0.166667	0.00	(Average)
waiting rm	105.5	64	1486.67	16.812516	3.97358	27	0.833333	6.21	(Average)
exam a4	105.5	1	36.5	93.093377	0.535084	1	0.583333	53.51	(Average)
exam a1	105.5	1	36.0833	60.295531	0.342064	1	0.333333	34.21	(Average)
exam a6	105.5	1	37.6667	53.628303	0.317	1	0.0833333	31.70	(Average)
exam b1	105.5	1	43.6667	53.286612	0.368295	1	0.166667	36.83	(Average)
exam b3	105.5	1	43.9167	79.554934	0.55256	1	0.5	55.26	(Average)
exam b4	105.5	1	41.9167	53.097183	0.350179	1	0.0833333	35.02	(Average)
exam c1	105.5	1	44.25	53.440436	0.373155	1	0.25	37.32	(Average)
exam c4	105.5	1	44.5833	48.120964	0.340057	1	0.166667	34.01	(Average)
exam c2	105.5	1	43.0833	76.793529	0.525031	1	0.583333	52.50	(Average)
doc a2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.5	1	247.833	5.521976	0.216185	1	0	21.62	(Average)
screen b	105.5	1	249.75	5.469246	0.215825	1	0	21.58	(Average)
screen a	105.5	1	245.75	5.476215	0.212614	1	0	21.26	(Average)
exam a2	105.5	1	38.0833	46.869180	0.281917	1	0.333333	28.19	(Average)
exam a3	105.5	1	37.1667	81.191982	0.47782	1	0.416667	47.78	(Average)
exam b2	105.5	1	43.75	51.430421	0.354762	1	0.25	35.48	(Average)
exam b5	105.5	1	43.4167	84.948344	0.586094	1	0.416667	58.61	(Average)
exam b6	105.5	1	41.9167	77.612011	0.515088	1	0.416667	51.51	(Average)
exam c3	105.5	1	43.1667	57.400518	0.391519	1	0.0833333	39.15	(Average)
exam c5	105.5	1	42.6667	81.686459	0.549744	1	0.333333	54.97	(Average)
exam c6	105.5	1	43.3333	76.344860	0.522548	1	0.5	52.25	(Average)

exam a5	105.5	1	37.3333	80.994323	0.478264	1	0.416667	47.83	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.5	37.08	33.76	29.16	0.00	(Average)
recption q	105.5	92.71	7.29	0.00	0.00	(Average)
waiting rm	105.5	52.89	47.11	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.5	9.75	0.00	46.49	43.75	0.00	0.00	(Average)
exam a1	105.5	10.17	0.00	65.79	24.04	0.00	0.00	(Average)
exam a6	105.5	9.84	0.00	68.30	21.86	0.00	0.00	(Average)
exam b1	105.5	12.37	0.00	63.17	24.46	0.00	0.00	(Average)
exam b3	105.5	11.67	0.00	44.74	43.59	0.00	0.00	(Average)
exam b4	105.5	11.54	0.00	64.98	23.47	0.00	0.00	(Average)
exam c1	105.5	12.10	0.00	62.68	25.22	0.00	0.00	(Average)
exam c4	105.5	12.16	0.00	65.99	21.84	0.00	0.00	(Average)
exam c2	105.5	11.56	0.00	47.50	40.95	0.00	0.00	(Average)
doc a2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.5	21.62	0.00	78.38	0.00	0.00	0.00	(Average)
screen b	105.5	21.58	0.00	78.42	0.00	0.00	0.00	(Average)
screen a	105.5	21.26	0.00	78.74	0.00	0.00	0.00	(Average)
exam a2	105.5	10.22	0.00	71.81	17.97	0.00	0.00	(Average)
exam a3	105.5	10.01	0.00	52.22	37.78	0.00	0.00	(Average)
exam b2	105.5	11.98	0.00	64.52	23.50	0.00	0.00	(Average)
exam b5	105.5	11.80	0.00	41.39	46.81	0.00	0.00	(Average)
exam b6	105.5	11.74	0.00	48.49	39.77	0.00	0.00	(Average)
exam c3	105.5	11.82	0.00	60.85	27.33	0.00	0.00	(Average)
exam c5	105.5	11.91	0.00	45.03	43.06	0.00	0.00	(Average)
exam c6	105.5	11.46	0.00	47.75	40.80	0.00	0.00	(Average)
exam a5	105.5	10.30	0.00	52.17	37.53	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	41.29897639	111.083	15.197659	0.309765	0.402510	0.00	69.47	(Average)
provider a2	1	38.80109722	109.583	15.279298	0.379631	0.421733	0.00	73.48	(Average)
provider b1	1	41.16490139	128.833	15.477303	0.317807	0.509746	0.00	82.32	(Average)
provider b2	1	38.63434167	127.917	15.477111	0.315617	0.423145	0.00	86.94	(Average)
provider c1	1	41.0443125	131.5	15.290739	0.290973	0.383814	0.00	82.88	(Average)
provider c2	1	38.845525	127.667	15.201725	0.341826	0.429133	0.00	85.11	(Average)
screener a	1	37.98488611	245.75	6.252215	0.786786	1.830440	0.00	75.90	(Average)
screener b	1	38.00068056	249.75	6.145246	0.688548	1.526731	0.00	74.87	(Average)
screener c	1	38.00720417	247.833	6.271976	0.759994	1.367429	0.00	76.42	(Average)
nurse a.1	1	41.24364028	217.083	9.457705	0.645224	0.617684	0.00	88.24	(Average)
nurse a.2	1	40.97326111	226.417	8.913795	0.647396	0.635528	0.00	87.83	(Average)
nurse a	2	82.21690139	443.5	9.150294	0.646947	0.625095	0.00	88.03	(Average)
nurse b.1	1	41.04486667	183.917	8.665703	0.464363	0.537199	0.00	68.03	(Average)
nurse b.2	1	40.93965694	174.75	8.992787	0.477823	0.541621	0.00	67.22	(Average)
nurse b.3	1	40.81112361	156.667	9.831056	0.482239	0.556513	0.00	65.69	(Average)
nurse b	3	122.7956472	515.333	9.107687	0.474676	0.543929	0.00	66.98	(Average)
nurse c.1	1	40.95654306	182.917	8.536993	0.448860	0.384024	0.00	66.56	(Average)
nurse c.2	1	40.89577361	175.917	9.092203	0.443803	0.396788	0.00	68.18	(Average)
nurse c.3	1	40.83840694	161.417	9.465214	0.441424	0.407680	0.00	64.91	(Average)
nurse c	3	122.6907236	520.25	8.982515	0.445104	0.394881	0.00	66.55	(Average)
clerk.1	1	37.952725	492.333	1.747224	0.008599	0.629721	0.00	37.96	(Average)
clerk.2	1	37.94691667	251	1.739686	0.010111	0.654181	0.00	19.29	(Average)
clerk	2	75.89964167	743.333	1.744655	0.009114	0.643076	0.00	28.63	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	41.29897639	68.09	1.39	1.87	28.66	0.00	(Average)
provider a2	38.80109722	71.69	1.79	1.98	24.54	0.00	(Average)
provider b1	41.16490139	80.66	1.66	1.40	16.29	0.00	(Average)
provider b2	38.63434167	85.19	1.74	1.13	11.93	0.00	(Average)
provider c1	41.0443125	81.33	1.55	1.03	16.08	0.00	(Average)
provider c2	38.845525	83.24	1.87	1.19	13.70	0.00	(Average)
screener a	37.98488611	67.42	8.48	1.19	22.91	0.00	(Average)
screener b	38.00068056	67.32	7.54	0.99	24.15	0.00	(Average)
screener c	38.00720417	68.16	8.26	0.91	22.67	0.00	(Average)
nurse a.1	41.24364028	82.57	5.67	1.80	9.96	0.00	(Average)
nurse a.2	40.97326111	81.86	5.97	1.80	10.37	0.00	(Average)

nurse a	82.21690139	82.22	5.82	1.80	10.16	0.00	(Average)
nurse b.1	41.04486667	64.56	3.47	3.09	28.88	0.00	(Average)
nurse b.2	40.93965694	63.82	3.40	2.88	29.89	0.00	(Average)
nurse b.3	40.81112361	62.60	3.09	2.55	31.76	0.00	(Average)
nurse b	122.7956472	63.66	3.32	2.84	30.17	0.00	(Average)
nurse c.1	40.95654306	63.22	3.34	2.24	31.20	0.00	(Average)
nurse c.2	40.89577361	64.99	3.18	2.07	29.75	0.00	(Average)
nurse c.3	40.83840694	62.01	2.91	1.97	33.11	0.00	(Average)
nurse c	122.6907236	63.41	3.15	2.09	31.35	0.00	(Average)
clerk.1	37.952725	37.78	0.19	0.41	61.62	0.00	(Average)
clerk.2	37.94691667	19.18	0.11	0.49	80.22	0.00	(Average)
clerk	75.89964167	28.48	0.15	0.45	70.92	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	736.583	8.08333	119.295830	14.838534	55.668196	24.831172	23.957928	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	12.40	46.90	21.21	19.48	(Average)

Annex D Statistical Printout of Models with 150 Patient Arrivals

D-6 Alternate Model D

General Report
Output from C:\NEAL\GMP\GMPMEDMO\ALT150D.MOD [Family Practice Clinic]
Date: May/29/1997 Time: 08:23:46 AM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.5 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.5	2	752.333	7.872874	0.937319	2	1.41667	46.87	(Average)
recption q	105.5	999999	752.583	0.587476	0.0694632	3.75	0.25	0.00	(Average)
waiting rm	105.5	64	1501.83	8.101028	1.93197	23.3333	0	3.02	(Average)
exam a4	105.5	1	40.4167	44.644655	0.283511	1	0.166667	28.35	(Average)
exam a1	105.5	1	38.5833	46.018242	0.279986	1	0.25	28.00	(Average)
exam a6	105.5	1	39.1667	52.665690	0.331368	1	0.333333	33.14	(Average)
exam b1	105.5	1	46.1667	27.160854	0.19663	1	0	19.66	(Average)
exam b3	105.5	1	46.1667	31.162262	0.227647	1	0.166667	22.76	(Average)
exam b4	105.5	1	48.9167	27.836593	0.215584	1	0.0833333	21.56	(Average)
exam c1	105.5	1	39.4167	36.540954	0.226672	1	0	22.67	(Average)
exam c4	105.5	1	39.5	34.716440	0.215582	1	0.0833333	21.56	(Average)
exam c2	105.5	1	37.9167	53.025687	0.315092	1	0.0833333	31.51	(Average)
doc a2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.5	1	247.417	5.540095	0.216495	1	0	21.65	(Average)
screen c	105.5	1	254.083	5.479705	0.219874	1	0	21.99	(Average)
screen b	105.5	1	249.417	5.449349	0.214711	1	0	21.47	(Average)
screen a	105.5	1	39.3333	51.090788	0.321435	1	0.166667	32.14	(Average)
exam a2	105.5	1	38	44.087948	0.266672	1	0.25	26.67	(Average)
exam a3	105.5	1	47.8333	26.761067	0.201763	1	0	20.18	(Average)
exam b2	105.5	1	47.75	29.216258	0.218924	1	0.0833333	21.89	(Average)
exam b5	105.5	1	47.1667	26.874342	0.201436	1	0.0833333	20.14	(Average)
exam b6	105.5	1	40.1667	37.673352	0.239315	1	0.0833333	23.93	(Average)
exam c3	105.5	1	37.6667	50.173003	0.299367	1	0.25	29.94	(Average)
exam c5	105.5	1	38.1667	53.934614	0.323358	1	0.25	32.34	(Average)
exam c6	105.5								

exam a5	105.5	1	38.5833	41.302128	0.253649	1	0.166667	25.36	(Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.5	31.03	44.20	24.77	0.00	(Average)
recption q	105.5	93.75	6.25	0.00	0.00	(Average)
waiting rm	105.5	65.51	34.49	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.5	10.81	0.00	71.65	17.54	0.00	0.00	(Average)
exam a1	105.5	10.71	0.00	72.00	17.28	0.00	0.00	(Average)
exam a6	105.5	10.53	0.00	66.86	22.60	0.00	0.00	(Average)
exam b1	105.5	12.73	0.00	80.34	6.94	0.00	0.00	(Average)
exam b3	105.5	12.75	0.00	77.24	10.01	0.00	0.00	(Average)
exam b4	105.5	13.27	0.00	78.44	8.29	0.00	0.00	(Average)
exam c1	105.5	11.03	0.00	77.33	11.64	0.00	0.00	(Average)
exam c4	105.5	10.89	0.00	78.44	10.67	0.00	0.00	(Average)
exam c2	105.5	10.25	0.00	68.49	21.26	0.00	0.00	(Average)
doc a2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.5	21.65	0.00	78.35	0.00	0.00	0.00	(Average)
screen b	105.5	21.99	0.00	78.01	0.00	0.00	0.00	(Average)
screen a	105.5	21.47	0.00	78.53	0.00	0.00	0.00	(Average)
exam a2	105.5	10.48	0.00	67.86	21.67	0.00	0.00	(Average)
exam a3	105.5	10.15	0.00	73.33	16.52	0.00	0.00	(Average)
exam b2	105.5	13.63	0.00	79.82	6.55	0.00	0.00	(Average)
exam b5	105.5	12.81	0.00	78.11	9.08	0.00	0.00	(Average)
exam b6	105.5	12.75	0.00	79.86	7.40	0.00	0.00	(Average)
exam c3	105.5	10.27	0.00	76.07	13.66	0.00	0.00	(Average)
exam c5	105.5	10.44	0.00	70.06	19.50	0.00	0.00	(Average)
exam c6	105.5	10.56	0.00	67.66	21.78	0.00	0.00	(Average)
exam a5	105.5	10.64	0.00	74.64	14.72	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a2	1	38.54970417	116.417	15.039564	0.354886	0.501048	0.00	77.38	(Average)
provider a3	1	38.38605417	116.333	15.317992	0.309971	0.429800	0.00	78.83	(Average)
provider b1	1	40.79871806	94	15.603242	0.340949	0.480387	0.00	61.04	(Average)
provider b2	1	38.1891625	93.0833	15.521039	0.242448	0.425046	0.00	63.92	(Average)
provider b3	1	38.24836528	96.5	15.041062	0.304949	0.477266	0.00	64.38	(Average)
provider c1	1	40.88660278	118.917	15.006430	0.285015	0.377714	0.00	74.09	(Average)
provider c2	1	38.25059444	113.167	15.452970	0.294041	0.356706	0.00	77.61	(Average)
screener a	1	38.00476389	249.417	6.225349	0.787030	1.829253	0.00	76.70	(Average)
screener b	1	37.99384722	254.083	6.155705	0.687825	1.527517	0.00	76.26	(Average)
screener c	1	38.02046806	247.417	6.290095	0.760696	1.377078	0.00	76.46	(Average)
nurse a.1	1	40.82100417	173	8.298656	0.602480	0.494309	0.00	62.82	(Average)
nurse a.2	1	40.82091944	153.167	9.722956	0.580793	0.516155	0.00	64.06	(Average)
nurse a.3	1	40.83246528	140.667	9.596619	0.564870	0.534148	0.00	58.18	(Average)
nurse a	3	122.4743889	466.833	9.131070	0.584462	0.512874	0.00	61.69	(Average)
nurse b.1	1	40.79716667	185.583	7.092178	0.418587	0.513219	0.00	56.78	(Average)
nurse b.2	1	40.81157222	151.417	9.550116	0.428392	0.544763	0.00	61.50	(Average)
nurse b.3	1	40.79871111	128.583	10.160623	0.427565	0.567676	0.00	55.04	(Average)
nurse b.4	1	40.79716667	102	10.801797	0.441137	0.605546	0.00	46.64	(Average)
nurse b	4	163.2046167	567.583	9.064488	0.427446	0.549700	0.00	54.99	(Average)
nurse c.1	1	40.84035972	179.75	7.621031	0.448962	0.374528	0.00	59.05	(Average)
nurse c.2	1	40.843075	151.917	9.675576	0.425001	0.396068	0.00	62.34	(Average)
nurse c.3	1	40.78544306	133.25	10.079754	0.420412	0.406309	0.00	57.03	(Average)
nurse c	3	122.4688778	464.917	8.967060	0.433223	0.390360	0.00	59.47	(Average)
clerk.1	1	37.94919167	496.25	1.749629	0.010117	0.597230	0.00	38.35	(Average)
clerk.2	1	37.94799722	254.667	1.749996	0.007127	0.677126	0.00	19.65	(Average)
clerk	2	75.89718889	750.917	1.749585	0.009138	0.641009	0.00	29.00	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a2	38.54970417	75.60	1.79	1.55	21.07	0.00	(Average)
provider a3	38.38605417	77.26	1.57	1.30	19.87	0.00	(Average)
provider b1	40.79871806	59.73	1.31	1.44	37.52	0.00	(Average)
provider b2	38.1891625	62.93	0.99	1.32	34.76	0.00	(Average)
provider b3	38.24836528	63.10	1.28	1.51	34.11	0.00	(Average)
provider c1	40.88660278	72.70	1.38	1.07	24.85	0.00	(Average)
provider c2	38.25059444	76.16	1.45	1.03	21.36	0.00	(Average)
screener a	38.00476389	68.09	8.61	1.18	22.12	0.00	(Average)

screener b	37.99384722	68.59	7.67	1.00	22.74	0.00	(Average)
screener c	38.02046806	68.21	8.25	0.90	22.64	0.00	(Average)
nurse a.1	40.82100417	58.56	4.26	3.07	34.11	0.00	(Average)
nurse a.2	40.82091944	60.42	3.64	2.79	33.14	0.00	(Average)
nurse a.3	40.83246528	54.94	3.24	2.69	39.13	0.00	(Average)
nurse a	122.4743889	57.97	3.71	2.85	35.46	0.00	(Average)
nurse b.1	40.79716667	53.61	3.18	3.68	39.54	0.00	(Average)
nurse b.2	40.81157222	58.85	2.65	3.15	35.35	0.00	(Average)
nurse b.3	40.79871111	52.79	2.25	2.75	42.21	0.00	(Average)
nurse b.4	40.79716667	44.80	1.84	2.33	51.03	0.00	(Average)
nurse b	163.2046167	52.52	2.48	2.98	42.03	0.00	(Average)
nurse c.1	40.84035972	55.76	3.30	2.48	38.47	0.00	(Average)
nurse c.2	40.843075	59.70	2.64	2.23	35.44	0.00	(Average)
nurse c.3	40.78544306	54.74	2.29	2.01	40.96	0.00	(Average)
nurse c	122.4688778	56.73	2.74	2.24	38.29	0.00	(Average)
clerk.1	37.94919167	38.13	0.22	0.38	61.27	0.00	(Average)
clerk.2	37.94799722	19.57	0.08	0.52	79.83	0.00	(Average)
clerk	75.89718889	28.85	0.15	0.45	70.55	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	748.417	4.16667	73.770443	9.049118	27.576919	24.765013	12.379394	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	12.29	37.31	33.74	16.66	(Average)

Annex D Statistical Printout of Models with 150 Patient Arrivals

D-7 Alternate Model E

General Report
Output from C:\NEAL\GMP\GMPMEDMO\ALT150E.MOD [Family Practice Clinic]
Date: May/30/1997 Time: 08:15:17 AM

Scenario : Normal Run
Replication : Average
Period : Final Report (0 sec to 105.5 hr Elapsed: 105.5 hr)
Simulation Time : 105.5 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util	
reception	105.5	2	740.667	8.118235	0.948015	2	1.08333	47.40	(Average)
recption q	105.5	999999	740.667	1.183533	0.137962	4	0	0.00	(Average)
waiting rm	105.5	64	1478.92	8.405567	1.97049	22.4167	0.25	3.08	(Average)
exam a4	105.5	1	44.4167	25.496512	0.178125	1	0	17.81	(Average)
exam a1	105.5	1	42.5833	25.871106	0.174139	1	0	17.41	(Average)
exam a6	105.5	1	42.0833	29.710111	0.195602	1	0	19.56	(Average)
exam b1	105.5	1	42.75	24.327625	0.163774	1	0	16.38	(Average)
exam b3	105.5	1	43.75	30.274943	0.209537	1	0	20.95	(Average)
exam b4	105.5	1	43.75	24.368546	0.16826	1	0	16.83	(Average)
exam c1	105.5	1	36.6667	39.395784	0.225992	1	0	22.60	(Average)
exam c4	105.5	1	37.25	34.841314	0.204097	1	0	20.41	(Average)
exam c2	105.5	1	38.75	42.092357	0.258199	1	0.166667	25.82	(Average)
doc a2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc a3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc b3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c1	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c3	105.5	1	0	0.000000	0	0	0	0.00	(Average)
doc c2	105.5	1	0	0.000000	0	0	0	0.00	(Average)
screen c	105.5	1	246.5	5.456588	0.212502	1	0	21.25	(Average)
screen b	105.5	1	250	5.498376	0.217085	1	0	21.71	(Average)
screen a	105.5	1	242.833	5.467085	0.209624	1	0	20.96	(Average)
exam a2	105.5	1	41.75	25.684422	0.169198	1	0	16.92	(Average)
exam a3	105.5	1	41	30.691795	0.200178	1	0	20.02	(Average)
exam b2	105.5	1	43.5	25.315948	0.173849	1	0	17.38	(Average)
exam b5	105.5	1	43.75	28.612579	0.198871	1	0	19.89	(Average)
exam b6	105.5	1	42.0833	27.216506	0.180434	1	0.166667	18.04	(Average)
exam c3	105.5	1	37.6667	36.515089	0.216103	1	0	21.61	(Average)
exam c5	105.5	1	38.3333	43.097748	0.260151	1	0.0833333	26.02	(Average)
exam c6	105.5	1	37.4167	40.286719	0.238461	1	0.166667	23.85	(Average)

exam a5	105.5	1	41.8333	31.263404	0.204969	1	0.0833333	20.50 (Average)

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down	
reception	105.5	34.49	36.22	29.29	0.00	(Average)
recption q	105.5	90.40	9.60	0.00	0.00	(Average)
waiting rm	105.5	65.24	34.76	0.00	0.00	(Average)

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down	
exam a4	105.5	11.92	0.00	82.19	5.89	0.00	0.00	(Average)
exam a1	105.5	11.78	0.00	82.59	5.64	0.00	0.00	(Average)
exam a6	105.5	12.25	0.00	80.44	7.31	0.00	0.00	(Average)
exam b1	105.5	11.57	0.00	83.62	4.80	0.00	0.00	(Average)
exam b3	105.5	11.80	0.00	79.05	9.15	0.00	0.00	(Average)
exam b4	105.5	12.10	0.00	83.17	4.72	0.00	0.00	(Average)
exam c1	105.5	10.57	0.00	77.40	12.03	0.00	0.00	(Average)
exam c4	105.5	10.71	0.00	79.59	9.70	0.00	0.00	(Average)
exam c2	105.5	10.57	0.00	74.18	15.25	0.00	0.00	(Average)
doc a2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc a3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc b3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c1	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c3	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
doc c2	105.5	0.00	0.00	100.00	0.00	0.00	0.00	(Average)
screen c	105.5	21.25	0.00	78.75	0.00	0.00	0.00	(Average)
screen b	105.5	21.71	0.00	78.29	0.00	0.00	0.00	(Average)
screen a	105.5	20.96	0.00	79.04	0.00	0.00	0.00	(Average)
exam a2	105.5	11.79	0.00	83.08	5.13	0.00	0.00	(Average)
exam a3	105.5	11.64	0.00	79.98	8.38	0.00	0.00	(Average)
exam b2	105.5	12.35	0.00	82.62	5.03	0.00	0.00	(Average)
exam b5	105.5	11.93	0.00	80.11	7.96	0.00	0.00	(Average)
exam b6	105.5	11.49	0.00	81.96	6.55	0.00	0.00	(Average)
exam c3	105.5	10.19	0.00	78.39	11.42	0.00	0.00	(Average)
exam c5	105.5	10.38	0.00	73.98	15.63	0.00	0.00	(Average)
exam c6	105.5	10.22	0.00	76.15	13.63	0.00	0.00	(Average)
exam a5	105.5	11.31	0.00	79.50	9.19	0.00	0.00	(Average)

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Minutes Per Usage	Average Minutes Travel To Use	Average Minutes Travel To Park	% Blocked In Travel	% Util	
provider a1	1	40.81570556	84.3333	15.670229	0.331711	0.448995	0.00	54.98	(Average)
provider a2	1	38.2042625	85.4167	15.409928	0.373033	0.516614	0.00	58.63	(Average)
provider a3	1	38.17262778	83.8333	15.774445	0.327632	0.439833	0.00	58.71	(Average)
provider b1	1	40.78808333	86.25	15.406334	0.341745	0.456124	0.00	55.48	(Average)
provider b2	1	38.24186528	85.6667	15.249826	0.242491	0.395370	0.00	57.81	(Average)
provider b3	1	38.16325556	87.5	15.310641	0.332216	0.455405	0.00	59.71	(Average)
provider c1	1	40.81080139	111.583	15.842708	0.284618	0.389439	0.00	73.33	(Average)
provider c2	1	38.32281528	114.083	15.253418	0.292032	0.361211	0.00	76.97	(Average)
screener a	1	38.00319444	242.833	6.243085	0.786446	1.831596	0.00	74.83	(Average)
screener b	1	37.98438194	250	6.174376	0.687950	1.527666	0.00	75.26	(Average)
screener c	1	38.0124125	246.5	6.206588	0.762003	1.395663	0.00	75.32	(Average)
nurse a.1	1	40.83798056	189.083	8.235459	0.616251	0.545940	0.00	68.29	(Average)
nurse a.2	1	40.82025	166.917	9.814902	0.575902	0.581411	0.00	70.77	(Average)
nurse a.3	1	40.82857361	151.25	10.373826	0.578458	0.629388	0.00	67.45	(Average)
nurse a	3	122.4868042	507.25	9.382012	0.591908	0.580455	0.00	68.83	(Average)
nurse b.1	1	40.79716667	198.167	7.799584	0.416473	0.552030	0.00	66.33	(Average)
nurse b.2	1	40.79716667	167.833	9.713088	0.418337	0.589143	0.00	69.25	(Average)
nurse b.3	1	40.79716667	153	10.190902	0.435695	0.619415	0.00	66.09	(Average)
nurse b	3	122.3915	519	9.088793	0.422931	0.581561	0.00	67.22	(Average)
nurse c.1	1	40.82164167	175.167	7.805507	0.449361	0.379321	0.00	58.82	(Average)
nurse c.2	1	40.79074167	145.833	9.951785	0.429271	0.387278	0.00	61.40	(Average)
nurse c.3	1	40.77816667	130.75	10.094161	0.424930	0.403662	0.00	55.90	(Average)
nurse c	3	122.39055	451.75	9.113021	0.436268	0.388586	0.00	58.71	(Average)
clerk.1	1	37.95535694	490.667	1.750810	0.009071	0.622332	0.00	37.91	(Average)
clerk.2	1	37.94908889	248.917	1.736682	0.010456	0.664628	0.00	19.10	(Average)
clerk	2	75.90444583	739.583	1.746006	0.009523	0.644898	0.00	28.51	(Average)

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down	
provider a1	40.81570556	53.84	1.14	1.59	43.43	0.00	(Average)
provider a2	38.2042625	57.24	1.39	1.96	39.41	0.00	(Average)
provider a3	38.17262778	57.51	1.20	1.61	39.68	0.00	(Average)
provider b1	40.78808333	54.28	1.20	1.63	42.89	0.00	(Average)
provider b2	38.24186528	56.90	0.91	1.46	40.73	0.00	(Average)
provider b3	38.16325556	58.44	1.27	1.74	38.55	0.00	(Average)
provider c1	40.81080139	72.03	1.30	1.02	25.64	0.00	(Average)
provider c2	38.32281528	75.52	1.45	1.06	21.97	0.00	(Average)

screener a	38.00319444	66.46	8.38	1.21	23.96	0.00	(Average)
screener b	37.98438194	67.71	7.55	1.00	23.74	0.00	(Average)
screener c	38.0124125	67.08	8.24	0.89	23.79	0.00	(Average)
nurse a.1	40.83798056	63.53	4.76	2.31	29.40	0.00	(Average)
nurse a.2	40.82025	66.84	3.93	2.09	27.14	0.00	(Average)
nurse a.3	40.82857361	63.87	3.57	1.88	30.68	0.00	(Average)
nurse a	122.4868042	64.75	4.09	2.09	29.07	0.00	(Average)
nurse b.1	40.79716667	62.96	3.37	2.65	31.02	0.00	(Average)
nurse b.2	40.79716667	66.38	2.87	2.25	28.51	0.00	(Average)
nurse b.3	40.79716667	63.36	2.73	2.00	31.91	0.00	(Average)
nurse b	122.3915	64.23	2.99	2.30	30.48	0.00	(Average)
nurse c.1	40.82164167	55.60	3.22	2.49	38.69	0.00	(Average)
nurse c.2	40.79074167	58.84	2.56	2.14	36.46	0.00	(Average)
nurse c.3	40.77816667	53.63	2.27	1.99	42.11	0.00	(Average)
nurse c	122.39055	56.02	2.68	2.21	39.08	0.00	(Average)
clerk.1	37.95535694	37.72	0.20	0.40	61.68	0.00	(Average)
clerk.2	37.94908889	18.99	0.11	0.49	80.41	0.00	(Average)
clerk	75.90444583	28.36	0.15	0.45	71.04	0.00	(Average)

FAILED ARRIVALS

Entity Name	Location Name	Total Failed	
patient	entrance	0	(Average)

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Minutes In System	Average Minutes In Move Logic	Average Minutes Wait For Res, etc.	Average Minutes In Operation	Average Minutes Blocked	
patient	738.667	2	67.347030	10.955840	19.731079	24.966121	11.693989	(Average)

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked	
patient	16.26	29.30	37.15	17.29	(Average)